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THE ARGUMENT FOR
THE INTELLECTUAL CHARACTER OF
THE FIRST CAUSE
AS IT IS AFFECTED BY THE RECENT INVESTIGATIONS OF
PHYSICAL SCIENCE.

Burney Prize Essay. A. D. 1868.

BY

GEORGE GILBERT SCOTT, JUN., B.A. F.S.A.
OF JESUS COLLEGE.



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Being the Burney Prize Essay
FOR THE YEAR ·CIC·IDCCC·LX·VIII·

BY
GEORGE GILBERT SCOTT, JUN., B.A. F.S.A.
OF JESUS COLLEGE.



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JOHANNI FLETCHER MOULTON, A.B.

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GEORGIUS GILBERTUS SCOTT.



ADVERTISEMENT.

THE late RICHARD BURNEY, ESQ., M.A., of Christ's College, Cambridge, previously to his death on the 30th Nov. 1845, empowered his Cousin, Mr Archdeacon Burney, to offer, through the Vice-Chancellor, to the University of Cambridge, the sum of £3,500 Reduced Three per Cent. Stock, for the purpose of establishing an Annual Prize, to be awarded to the Graduate who should produce the best Essay on a subject to be set by the Vice-Chancellor.

On the day after this offer was communicated to the Vice-Chancellor, Mr Burney died; but his sister and executrix, Miss J. Caroline Burney, being desirous of carrying her brother's intentions into effect, generously renewed the offer.

The Prize is to be awarded to a Graduate of the University, who is not of more than three years' standing from admission to his first degree when the Essays are sent in, and who shall produce the best English Essay "on some moral or metaphysical subject, on the Existence, Nature, and Attributes of God, or on the Truth and Evidence of the Christian Religion." The successful Candidate is required to print his Essay; and after having delivered, or caused to be delivered, a copy of it to the University Library, the Library of Christ's College, the University Libraries of Oxford,

Dublin, and Edinburgh, and to each of the Adjudicators of the Prize, he is to receive from the Vice-Chancellor the year's interest of the Stock, from which sum the Candidate is to pay the expenses of printing the Essay.

The Vice-Chancellor, the Master of Christ's College, and the Norrisian Professor of Divinity, are the Examiners of the Compositions and the Adjudicators of the Prize.

In the event of the exercises of two of the Candidates being deemed by the Examiners to possess equal merit, if one of such Candidates be a member of Christ's College, the Prize is to be adjudged to him.

The thesis proposed by the Vice-Chancellor for the year 1868, was as follows:—

“ The recent discoveries of Science do not tend to impair the force of the argument for the existence of an Intelligent First Cause.”

The prize was awarded to the author of the following Essay.

PART I.

1. "OF all antagonisms of belief, the oldest, the widest, the most profound and the most important is that between Religion and Science." A more momentous question than the one here proposed cannot be raised, nor one which is of greater practical importance at the present day. There is no controversy which covers by the nature of the case a wider area, for its materials are the whole of the accumulated stores of Science, and its battle-field is the Universe. Not only must the limits of an Essay of necessity cramp a discussion for which volumes would scarcely suffice, but the limits of the writer's knowledge impose still narrower restrictions. The "Burney," however, is not an Essay in Physical Science. All that can fairly be expected of a competitor is a general acquaintance with the progress of the Natural Sciences, as it bears upon moral and metaphysical subjects. It is to the tendency of scientific discovery rather than to its constituent items that our attention has to be directed, and if this be duly apprehended imperfections and even mistakes in matters

H. Spencer's
First Principles, p. 11.

of detail will not materially weaken the force of the general argument. It is necessary to make this apology, because the consideration of our theme would be incomplete if our view of the position of the argument, as affected by the general progress of Science, were not at the least illustrated by special examples. I do not conceive that any good would be done by examining seriatim a number of recent physical discoveries, and endeavouring to disprove in each instance the assumption that it had weakened the evidence of an Intelligent First Cause. Such a process would be both tedious and unsatisfactory. It would fail to leave a general impression upon the mind, and as the list could not be exhaustive, there would naturally remain a suspicion that such instances had been selected as lent themselves the most readily to the argument. More than this, such an examination would require a detailed knowledge of the Physical Sciences in their latest development, such as the writer has no pretension to, and the reasoning would be invalidated in every case in which the facts were not defined with rigorous scientific accuracy.

It will be more suitable, I think, to the objects of the Burney foundation, and will lead to a better understanding of our argument, if we consider rather the general relation which the facts of science bear to the reasoning by which the existence of an Intelligent First Cause is sought to be established, and endeavour by way of illustration to shew how some of the most important of recent discoveries are examples of the principle which we have laid down, and still more, how the general tendencies of Scientific Progress confirm instead of weakening the intellectual basis of Religion.

In order that the position which Science at the

present time occupies in relation to this argument may be the more readily displayed, it will be well to explain the form which, as I take it, that argument most naturally assumes. I commence with one remark which is of importance to a right understanding of the whole of the subsequent reasoning.

We are not concerned in this investigation with the absolute demonstrative strength of the proposed proof. It may be true (I think it is so) that such reasoning cannot in the nature of things amount to demonstration; that it is from reflection upon the practical reason, upon conscience and the sense of duty, that the intellectual argument derives a convincing power which it cannot of itself possess. Our present object is to shew that the force of the intellectual proof, be it more or less, is not impaired, but rather confirmed, by the discoveries of recent science.

2. An argument by which the existence of that which is not intuitively known is sought to be established can only be founded upon such existence as is known to us directly. Arguments as to the modes of such being as is not directly known must be based upon the modes of that existence of which we are immediately conscious. Existence known is the only possible ground for belief in an unknown existence.

In taking up this position, we virtually deny the validity of the ontological proof of Descartes and Leibnitz. The objection which Kant has made to this method appears to be unanswerable.

"It is absurd," he says, "to introduce, under what-
 "ever term disguised, into the conception of a thing,
 "which is to be cogitated solely in reference to its
 "possibility, the conception of its existence." In this

*Critique of
 Pure Reason.*
 Bohn's
 Trans. p. 367.

Cf. Father
Roux-
Laverne's
*Compend.
Philosophie*,
III. i. 1.

rejection of what has been called (though inaccurately¹) the *à priori* proof, he had been anticipated by Aquinas, who has shewn the fallacy of basing the intellectual conviction of God's existence on intuition, instead of on demonstration. This method is now indeed generally discarded, and all existence other than that which we directly know—our own—is held to require an *à posteriori* proof. An argument for the existence of that which is not given to us by intuition may be an immediate deduction from the known, or it may be deduced mediately from it by a chain of two or more syllogisms. It is evident, I think, that the value of an argument of one step is greater than that of a series. If this be so, that being which is proved directly from known existence will rank higher as to certainty than any which can be deduced from the data of intuition only through a chain of successive reasonings. Let us apply these considerations to the problem before us.

3. We might have imagined that the assertion that we know ourselves to exist was one at which none would cavil. Those, however, who wish to question the conclusions, which flow logically from this elementary fact, have frequently endeavoured to throw doubt upon it. No one, of course, can attempt to disprove it; it admits neither of proof nor of disproof, for on what more elemental than itself can an argument be based? An attempt, however, is made to throw it back into obscurity, as a thing at least uncertain, and the savage who is so favourite an oracle with the school of Locke has been made to declare more than once, that he at least has no abstract knowledge of his own existence.

¹ The genuine *demonstratio a priori* is such as deduces effect from cause.

If it could be shewn that we know of no being whatever, that the word existence is an empty concept, derived not from experience but from the fancies of metaphysicians, it would certainly be unnecessary to proceed any further with such an investigation as the present. It will therefore be well to spend a few moments upon this point, not to prove but to explain. We are not, it is argued, immediately conscious of our own existence, for consciousness gives us no such thing: it gives us sensations, feelings, volitions, but not existence. Since Phenomena alone can be known, the Ego it is urged is as unknown as the non-Ego. It is like the latter, nothing but a logical conception, brought in to give unity to the phenomena of consciousness. Existence is even unthinkable; it is a conception dependent in a great measure on memory; it arises from our observation of the external world. It is at any rate not original but derivative, the result not of experience but of reflection.

Now these and such like objections are due to a confusion between analysis and deduction. It is perfectly true that consciousness does not give us absolute existence; more than this, it does not give us our own existence as a distinct or isolated experience: what it does give, is existence in a mode. At any one instant of consciousness we are in some one definite state, and this state contains analytically two elements. We exist, as opposed to non-existence: we exist in this one definite mode as distinguished from all other modes. Now in every simple state of consciousness, however instantaneous, these two facts are given. They are given necessarily in conjunction. Existence is existence in some mode, just as motion is motion of some body;

but as the perception of a moving body gives us upon reflection two elements, the body and the motion, so every single act of apperception gives us when we analyse the experience the two elements, our existence and a certain mode of it. The question as to whether the Ego is knowable in any other sense than as an observed correspondence among certain phenomena, does not affect our argument. What it is necessary for us to exhibit is our intuitive knowledge that something exists, which we call ourselves. It is not required to our position that the nature of that something in itself should be known or even knowable. Again, to say that our own existence is unthinkable is merely to express in another way the fact that experience never gives, and never can give, the two elements of consciousness otherwise than as conjoined. What experience has never given is necessarily unthinkable, in the sense of this objection, and the remark may be applied with equal truth to either factor of consciousness. A state or mode of being is as unthinkable when separated from being itself as is existence unconditioned. We cannot think of pain, for example, except as the pain of some being—ourselves or another similarly constituted.

Our existence is a fact given implicitly by experience, but it is unfolded only by an analysis of the datum of consciousness. Now to analysis, as to every mental process, memory is essential. Thought is successive, and the succession must be realised as a whole, which memory alone renders possible. It is certain that if each instant of consciousness passed into oblivion, as the next succeeded it, we should be unable to perform any process of analysis. The datum of consciousness would contain as really as now the two elements, but the

power to separate them would be wanting. Our own existence is given us in every moment of consciousness, but the realisation of it requires an act of intelligence, though one of the most obvious and universal, for the performance of which memory is essential¹. It is only in this sense that the knowledge of our own being can be attributed to that capacity.

Another suggestion which is very commonly made is this, that our notion of existence is derived from the external world. It is said that the sense of the reality of the world about us precedes, as a matter of fact, reflection upon our own nature, and that when we come to think of ourselves we apply without sufficient warrant to our own being that existence and individuality which external objects have previously suggested to us. There is a confusion here between the notion of abstract Being and that existence which we know as our own. As it is our own sensation, and not sensation in the abstract, which consciousness gives, so it is our own existence, and not abstract existence, which it reveals to us. To the formation of the conception of abstract existence, our acquaintance with the external world largely contributes. It is true that in any case conception *may* result from one presentation, by the exercise of Imagination; but where the notion is highly abstract and the function of Intelligence therefore purely symbolic, plural presentation is a practical condition of its formation. It is from the realisation of ourselves as existent, and of something outside ourselves as also existent, that we

¹ We may remark, by the way, that the importance of memory is scarcely recognised as it should be. It is classed as one department of the intellect. It is in reality a practical condition of the possibility of thought in general.

come to form the logical conception of abstract Being. This method is entirely distinct from that by which we realise our own existence, and the difference of the processes shews the different nature and value of the results. One is arrived at by analysis of a single datum, the other by generalisation from many data. Abstract Being is a logical concept and nothing more. Our own existence is known to us as directly, and is a fact as certain, as is pleasure or pain at the moment at which we experience them.

I have thought it well to spend some little time upon this explanation of the "*Cogito ergo sum*," because upon this all arguments for existences other than our own must, I consider, be based. The suspicion of a flaw here would, therefore, throw doubt upon the subsequent reasoning. It is upon this account that I have laboured a point which I might, perhaps, have fairly assumed.

4. Were our own existence the only element in consciousness, we should be content to rest there. The mind would not be driven, as it now is, to ask the question—Why? Existence in itself is its own justification. There is no chain of causes, however prolonged, which does not at last end, as it began, with existence. There is no mode of accounting for Being which does not posit Being in the last resort. That things exist requires in itself no solution, and it admits of none. Were this all that we knew, no process whatever could lead us any farther than the point from which we started. But with the fact of our own existence is bound up the second fact, that we exist under modifications. We have seen that the datum of consciousness contains two elements, which the practical analysis of everyday life, no less than the scientific procedure of reflection, clearly distinguishes.

Our existence, at any moment, in order to be conscious, must be existence in a definite state, and we cannot think of this state without passing by the very act into another. Memory, which renders reflection possible, supplies it with an additional fact. Not only do we see upon consideration that we exist, and that in a certain definite mode, but we see further that this mode changes in every instant of consciousness. Our being is seen to be successive, variable, limited. It cannot by any possibility be conceived of as infinite or as perfect. This point we will dwell upon for a moment, as it is not so free from confusion as might at first sight appear.

We remark then that this statement is not identical with the assertion, that our existence is given us as conditioned. The two thoughts are quite distinct, and are relative to different points of view. The similarity of the language in which the two are of necessity expressed, renders it somewhat difficult to keep them clearly distinguished. Great confusion exists in many minds between logical and real limitation. Every predication is a logical limitation, and from this Hamilton, Mr Spencer, and others have argued that it is impossible to predicate anything whatever of the Infinite. By doing so, they argue, we limit that which is by the definition illimitable. It must follow from this position that the Infinite cannot be asserted to exist, nor yet can it be considered as non-existent. It can therefore be no object of knowledge at all. A solution of this paradox will serve to clear up one of the difficulties of our argument. Predication is considered as limitation *logically*, because it is a step towards definition. It limits the subject in two directions. Every statement asserting the possession of an attribute is a virtual negation of the possession of all

other inconsistent attributes. It is thus a limitation of connotation. Again, every assertion of the possession of an attribute virtually excludes from the class to which the conception refers all such things as do not possess the attribute predicated. It is thus a limitation as regards denotation. But when from the subjective we turn to the objective—from the thought to the thing—the case is exactly reversed. The possession of an attribute, so far from limiting reality, is essential to it. Reality is just that which possesses the attribute existence. “*Ens reale in communi, dicitur id quod habet aut aptum est habere esse seu existentiam.*” And the addition to the being of a new attribute, so far from being a limitation, is in truth an extension of reality. The Infinite, of which the writers whom I have mentioned are really speaking, is a merely logical abstraction. “The unconditionally unlimited” is simply the summum genus of which something and nothing are species. That such a concept should be unthinkable, is very far from indicating any imperfection of the human intellect. It tends rather to shew the agreement of the limits of Thought with those of Reality. This logical Infinite, which has neither existence nor nonentity, is nothing but an empty concept. It is useful only as giving unity to the ascending series of analysis, and a starting-point to the descending chain of synthesis, but beyond the province of logic it possesses no value whatever. Again, the absolute or unconditionally limited is a merely logical abstraction. It is defined as the subject of the sum of all predication. It is, thus, that in which all contradictions meet. That this, too, is unthinkable does not appear to shew any very serious limitation of the power of thought. The only infinite which can concern us

Roux-
Laverne's
Compend.
Philosophiae,
III. i. 1.

is that which exists, and this—a conditioned Infinite—though it be logically a contradiction, we can and do think, however inadequately¹.

To apply these considerations to the point in our argument at which we have arrived. It is not because our existence is known to us as conditioned in the logical sense, that it is known as finite in the real sense. It is impossible to base any valid argument for real existence upon a proposition merely logical. The notion of ourselves as finite is impressed upon us in the act of consciousness itself. Reflection and experience bring the truth into greater prominence, but cannot add to its certainty. Just as the knowledge of our own existence is a distinct thing from the logical conception of Being—the one given in the single fact of consciousness, the other generalised from successive experience—so in this second element of the original datum, the knowledge of our own finite nature is a very different thing from the technical limitation involved in predicating of our existence any one mode, or even modification in general. In truth, consciousness itself witnesses to the finite character which is involved in the very fact of change. Change and succession are the conditions of consciousness and thought, and to change is to be limited. What reflection shews us, conscience witnesses to with equal force, and the sense of dependence is the root of that emotional

¹ In this distinction we may find an answer to one of the objections urged by Kant (*Critique of Pure Reason*, p. 375) against such an argument as the present. "Reason," he says, "removes all conditions,—and as after this it is beyond our power to form any other conception, it accepts this as a completion of the conception it wishes to form of the series." Our reasoning aims not at removing but at establishing. It seeks to add to the conception of a First Cause the conditions of Reality and of Intelligence.

conviction of God's existence which in practice supplements and confirms the moral and the intellectual.

The confusion of logic and ontology has been fruitful of paradoxes in many branches of thought. It is this alone which has enabled any one to question the facts which lie at the root of all knowledge. But for this confusion it would not have been necessary to delay so long upon the very threshold of our inquiry.

5. The knowledge of self, as I have now defined it, is the only knowledge (in the strict sense of the term) which we possess. How comes it that we cannot rest satisfied with this? What is it which urges us to seek for something beyond, to ask the question *Why?* To this point we now address ourselves.

In some way or other the conception of Cause does exist in the mind. This fact cannot be questioned; it is admitted by those who would detract from its significance, in the very efforts which they have made to explain it away. The origin of this notion, and of the subjective necessity, by which we find ourselves driven to apply it, is one of the most disputed points of philosophy, and I have no intention of entering upon the question here. Without, however, pretending to discuss the nature of this conception, I shall suggest some considerations which may tend to throw light upon the fact that we do inevitably apply the principle to everything with which we come in contact. This is done by the practical man no less than by the philosopher. It is the very root-principle of Science, and there is thus the less reason to insist upon it here, because it is only by assuming its validity that the discoveries of Science can become the basis of an argument at all. We remark then that we are forced to apply the question *Why?* to the datum of

consciousness, not as it gives us existence, but because this existence is given as limited. Limitation is, as we have seen, revealed in each single act of consciousness, but our impression of it is intensified by the fact which memory enables us to realise, that change and succession are inseparable modes of our being. Not only do we exist as finite, but—which is part of the same truth—the mode of our being changes every instant. Existence in itself demands no cause. It is limited, imperfect, changing being, which cannot by possibility be viewed as ultimate. We view such as an effect, because in the formation of the conception is necessarily implied the apprehension, however vague, of an existence which is unlimited. It is, I conceive, to this antithesis between being, as we immediately know it, and that undefined conception of infinite being, without which the former cannot be mentally realised, that the notion of cause is primarily due.

6. Existence then can only be proved from existence. Our own existence is known to us as of such a nature as to demand a cause. It cannot be conceived for a moment as self-caused, as self-existent. No one has ever maintained such a position. Locke, who started with a denial of any innate principle, preferred to contravene his own rule rather than maintain that we are self-evolved, or that we developed from nothing. He declares, in the chapter of his *Essay* which treats of the Existence of God, that man knows “by an intuitive certainty” that nothing cannot produce something; and he asserts this in order that he may apply it—as we have done—to man’s own existence, and shew from that the necessity of believing in a Creator.

Blk. III. cap.
X. sect. 3.

The existence of a cause superior to ourselves is the

conclusion of a syllogism of which the minor is the assertion of a fact which is intuitively known, and the major a principle which we of necessity apply to every item in the aggregate of experience, to every fact with which we are brought in contact. This principle cannot reasonably be questioned by those who would base upon scientific discoveries an argument against the conclusion which it is here used to establish. If it holds good in Science it is valid in Philosophy; if it cannot be relied on here it can ground no argument there.

7. Against the method of proof which I have here adopted, two principal objections have been raised. On the one hand it is urged that the form of causation which experience gives us is not the efficient but the phenomenal. Causation, as we see it in the external world, is not that "mysterious and most powerful tie" which some have imagined, but only "an invariable order of succession." No one has worked out this view more lucidly than Hume in his "Inquiry." "According to these opinions," says Kant, "it is by means of the perception and comparison of similar consequences following upon certain antecedent phenomena, that the understanding is led to the discovery of a rule according to which certain events always follow certain phenomena, and it is only by this process that we attain to the conception of cause." But, as he proceeds to shew, this account fails to explain the features of universality and necessity with which the notion is invested. It is more to our purpose to remark that it fails also to account for the most curious feature which the notion possesses, that namely of efficiency. What we desire when we ask the question "Why?" is not "the invariable antecedent," but the force which pro-

Mill's *Logic*,
III. 5.

*Critique of
Pure Reason*,
p. 146.

duces and modifies. It is beyond all question an *efficient* cause that we seek. We are here assisted by the criticisms of those who doubt or dissent from our conclusion. Much pains is expended to shew that experience does not reveal to us efficient cause, that nature shews us only a uniformity of succession. That which is denied as an objective fact is virtually admitted to exist as a subjective desideratum. It is this which accounts for the fact that we do not rest satisfied with the "explanations" with which Science at any given time presents us, but press on ever farther and farther. The second objection is one which Kant has dwelt on with great force, the unwarrantable character, as he considers, of the procedure by which we pass from empiric contingency to transcendental and necessary being. He questions the right to extend the principle of causation beyond the limits of experience. The considerations on which we have just dwelt suggest an answer to this objection. It is precisely because experience gives us in no instance such a cause as is adequate to our conception, that we are led to pass beyond the limits of experience. The subjective necessity, under which we find ourselves placed, to seek for the cause of what is—is the origin of all Science, but Science fails to satisfy the want, to meet which it came into being. We ask for causes, and are given only "invariable antecedents." And if we are driven by the failure of every other attempt to seek in the region that lies beyond experience for the true answer to our inquiry, I do not think that Science can urge any serious objection to the procedure. It is difficult to find any defence for the process of Induction by which Science has come into being, except by assuming the validity of the notion of

causal efficiency. It is this notion, as a mental fact, which accounts for the otherwise extraordinary method, by which from many cases the mind presumes to judge of all; and only on the assumption of its correspondence with objective truth, can the results of the inductive process be viewed as possessing any real value.

Upon these considerations then is based the reasonable belief that there exists as the ground of our own consciously finite being, a cause superior to ourselves, and this either an infinite one, or one which, though it transcend us, is yet like ourselves finite. In the latter case it is obvious that the same reasonings will apply again, and thus by one step or by many we are led to that which alone can finally meet the requirements of the argument, namely—an existence without limitations. Finite being exists as an effect of an Infinite cause¹.

8. As existence is demonstrable only from existence already known, so arguments for the mode of an unknown existence can only be based upon the modes of known being.

The conception of cause is that of a relation. A proportion between the effect and the cause is part of the notion itself, and this proportion is one of equality. Given any effect, the principle urges us to seek an adequate or commensurate cause. A cause which did

¹ It has been questioned by some whether we can have a right thus to pass from the finite to the Infinite, whether any reasoning which contains an Infinite term can have any meaning for us. The consideration of this difficulty would take us too far from the main object of our thesis. It will be sufficient to remark that its solution lies in the distinction on which we have already dwelt, between the Logically Unconditioned and the Infinite Reality.

not equal or exceed its effect would be the cause only of a portion of the effect, and not of the whole. I conceive therefore that the nature of the First Cause can be known to us in some small degree through the nature of its effects. It does by no means follow from this, that what is not observed in the effect does not exist in the First Cause. It does follow from it that we can know of no such elements, however real. What we can know of the nature of the cause is, that it at the least is commensurate with all that is in the effect, so far as that is not inconsistent with the very nature of such an existence. "Deo attribuimus omne quod
"in animâ humanâ infinitudini divinæ non repugnat." Roux-La-
vergne, III.
3.

And this brings us to that which is the main point of our thesis, namely, the attribution to the cause of all things of an intellectual character.

9. That we are ourselves intelligent beings will not I think be questioned. The fact is forced upon our attention by the contrast between ourselves and those merely material objects which experience reveals to us. But it is given more directly still in the exercise of the simplest act of thought. We not only think, but we know that we think. By the power of reflection we make our mental processes an object to themselves, and the ability to form such processes is what we mean by intelligence.

10. The investigations of Physiology into the material concomitants of thought can have no tendency to throw doubt upon the reality of intelligence itself. However close the connection which we may be able to detect between the several mental processes and certain distinct conditions of the brain and nerves, such connection must

Newspaper
reports.

ever remain to us one of simultaneity only. There is no tendency in the advance of Physiology to the identification of thought and nervous action. Indeed such a result may be readily shown to be impossible in the nature of the case. Study the physical facts as we will, the fact remains that it is *we* who are studying them, and the antithesis of subject and object can never be removed, even in the cases where matter and mind meet the most intimately. That such is the conviction of scientific men, no less than of philosophers, is shown by the very clear statement of this view which was made by Professor Tyndall at the recent Norwich Meeting: "Thought and sentiment, love and hatred," he says, "are accompanied doubtless by movements in the molecules of the brain, but the mode of connection between the two is simply, to us, unthinkable. The connection between mind and matter is not necessary, but empirical. If we could see all that takes place within the skull as clearly as we observe the outer phenomena, if we could note for instance that the sentiment of love was always attended by a spiral movement of the brain-particles to the right, while that of hatred was indicated by a spiral movement to the left, we should still be as far as ever from conceiving the nature of the law which ordered it."

The processes of the mind are known to itself immediately by reflection, the existence of brain and nerve is strictly hypothetical. However great the probability of the objective existence of such things, they are parts of that external world, which is known to us not directly, but only mediately. They stand upon altogether a different level as to certainty from that which is occupied

by the mental phenomena. Intelligence is the name which we give to those operations of the mind by which, among other things, the existence of the organism which we call our body is inferred, and the attempt to resolve the one into the other involves a confusion of thought which borders upon the ludicrous. However true it is, that the knowledge of the external world precedes, historically, that reflection upon our own mental nature which gives us occasion for such a word as intelligence, it cannot be seriously denied that only by the exercise of mental effort can sensation produce thought, even in its simplest form.

Upon the fact of our own intelligence is based the only unassailable proof of the Intelligence of the Creator. Here as before we claim of science to admit unreservedly the validity of a principle on which all her own conclusions rest, the necessary adequacy of cause and effect. The existence of Intelligence is the consequent—implies that Intelligence exists in the antecedent. However vast the interval between the two (and we cannot even guess what is the effect of the introduction of the element of infinity), this at least seems clear, that unless Science be an impossibility, and reason a delusion, there exists, as the ground and cause of our own finite Intelligence, a supreme and infinite Mind.

I have thought it well thus to expose, in its simplest elements, “the argument for the existence of an Intelligent First Cause,” both to avoid any ambiguity in the subsequent discussion, and also because several points in the reasoning appear to me to be affected, and that not unfavourably, by considerations derived from a survey of the Physical Sciences in the present stage of their advance.

11. I now proceed to enquire what is the bearing of

Science in general, and of its more recent discoveries in particular, upon the position we have taken up.

In the first place, we may remark that from the nature of the case the negative proposition is evidently incapable of proof. It is impossible to demonstrate that an Infinite Being endowed with intelligence does *not* exist. All that any reasonings can do is to weaken or destroy the proof, and so to leave the question in uncertainty, or to set it aside as incapable of a solution. I hope to be able to show that the general tendency of the results at which Science has arrived is to strengthen and confirm the position of the Natural Deist, and that this is true in a remarkable manner of some of its more recent discoveries.

The argument which we have been exhibiting may be attacked either in the minor premiss or in the major. The truth of our existence—that it is known to us as finite—the reality of intelligence—these may be called in question. Or, on the other hand, the validity of the principle that an effect implies an adequate cause, may be disputed, or its extension beyond the sphere of experience condemned.

It is upon the latter class of objections that the discoveries of Science most directly bear. Upon the former I shall make only a few observations. Natural Science is concerned with realities. It deals with things, not with abstractions. When we say that phenomena alone are its objects, we mean merely that things are known to us only as they affect ourselves, not absolutely as they are. Physics are concerned not with our own subjective states, but with the information which these give us, of realities external to ourselves.

The truth of our own existence, and of its consciously

imperfect nature, Science cannot touch. These things lie out of its sphere. It is concerned only with the *non ego* as it is phenomenally known to us. In the same way intelligence is not a subject of Natural Science, in any proper sense of the term. We have already remarked upon the radical distinction which there is between thought and its physical accompaniments. The two belong to spheres utterly remote. There is no possibility of resolving the one into the other. No discoveries as to the nature of the nervous system or of the brain can have any tendency to explain away the reality of the faculty by which alone such discoveries can be effected. These primary data, on which our reasonings are built, science can neither call in question nor confirm. It is upon the process by which from these elements we endeavour to ascend to higher truths, that considerations of Science have a legitimate bearing, and to this we will now direct our attention.

12. Science is based upon the question Why? "To Dr Hooker
at Norwich. search out the whence and whither of his existence is "an unquenchable instinct of the human mind," and it is one which we inevitably extend to everything with which we come in contact. That instructed curiosity, of which Science is the fruit, is but the extension to the things around us of the enquiry which is of such momentous practical importance when brought to bear upon ourselves. The aim of Science is explanation. It assumes then, of necessity, that the question, why, is a legitimate one. To ask for the why, is to seek a cause, and the success which Science has met with in prosecuting the search is a justification of the reasonableness of the attempt. The progress of Science strengthens continually the belief in the universality of causation. It is no longer possible to rest

Mill's *Logic*,
I. 363.

content with any single fact, however remote. Where no cause can as yet be assigned, Science holds none the less strongly that a cause does exist. "The notion of cause" is the root of the whole theory of Induction," and from Induction all our knowledge—not intuitive—is derived. Science, which is the methodical and exact expression of such knowledge, is rendered possible by this notion alone. It is a conception, not given in experience (for this can show us only succession), but it is one which being of necessity assumed by us, is abundantly justified by the result. Viewed in this light causality is an hypothesis the truth of which can only be shown by its accordance with facts in every instance in which its validity can be tested. This proof from experience is therefore cumulative, and by the gradual progress of Science the conviction that the principle is a sound one has been constantly increasing, until from an hypothesis it has become an axiom. Science appears thus to confirm the validity of the general proposition which forms the major premiss of our argument.

13. But it may be objected, that it is not to the existence of things that Science applies the principle of causation, but only to the modes and changes of being. It seeks no cause which is not itself a phenomenon. It is not the efficient, but the physical cause with which it is concerned. This is perfectly true, and it is because it is thus confined, that we are forced, as I have already shown, to seek an answer from a sphere which transcends these limitations. Existence pure and simple requires, as I have said, no explanation. It is the *modes* of being and its changing modifications which lead us to seek a cause. So with phenomena, it is their finite character, the perception of their limitations, the

observation of their changes, from which Science takes its origin. That the only causes which Science can grasp are phenomenal, is, in a sense, an accident of the case; that which the mind aims at is not they, but something that lies beyond. The difference between the reasonings of Science and that which we have been exhibiting is mainly this: in the one case we can trace a series of ever-widening causes; in the other there is either but one step between the fact and its ultimate basis of reality, between the known effect and the first cause, or if there be an ascending series, it does not lie within our ken. We are, as regards the cause of our own existence, in the position of a man knowing but one physical fact, and applying to that the notion of cause. He would be quite unable to tell whether the effect, which he observed, was brought about by the first cause, directly, or through a chain of causation, but he would be forced to conceive such a cause, or to question the value of his instincts as directing him toward Truth. That observation shows us an ascending series of facts which are at once effects and causes, so far from throwing doubt upon the truth of the assumption of causation, cannot but serve to strengthen it. For the series is not a mere succession, but a constant convergence. Every one of the countless advances of Science brings us so much nearer that unity, which in the inquiry into the ground of our own existence we *may* reach at a single step.

14. As the advance of inductive knowledge thus strengthens our conviction of the truth of causality, so although it cannot add to the certainty of our knowledge of the finite character of our being, it yet forces the consideration of the truth upon us in a very striking manner.

For the admission of the existence of an indefinite number of things beside ourselves destroys the faintest suspicion of self-generation, and gives, of necessity, to our conception of the cause of our own being a wider and truer character.

15. As Science thus confirms the separate elements of our argument, so does it strengthen by a remarkable parallel the validity of the reasoning considered as a whole.

The only proof of the existence of the material world is a syllogism parallel to that on which is based the belief in a God. It is an argument from sensation to an objective ground of sensation, in virtue of the principle that causation is universal. The procedure by which, from subjective intuitions we infer objective realities, is one which cannot be justified by any rigorous demonstration. Every objection which can be urged against the argument which we are considering tells equally against the logical and rational grounds upon which this inference is made. The proceeding has also a peculiar weakness from which the other is free, to which I shall presently allude. In this case, however, as in the one with which we are in this treatise concerned, men have come, with very few exceptions, to the same conclusion ; and Physical Science adds vastly to the probability that this conclusion is a just one, and in accordance with reality. It appears to me to have rendered a denial of the objective existence of things almost impossible. So strong is its effect in this direction upon those who are devoted to it, that there are some who seem inclined to believe that the facts of mind, which are immediately known to us, will in time be found resolvable into physical effects. However pal-

pably absurd such theories may be, they are not without their value, as showing how strongly scientific study impresses upon the mind the real existence of matter and its forces. No one who investigates the nature of light can bring himself to view it as nothing but a subjective modification of ourselves. No one who studies the Solar System, and the forces which maintain its equilibrium, can conceive the whole to be merely a series of states of consciousness. No one who examines into the Origin of Life and the laws which regulate its development, can doubt for a moment the object of his study has an actual existence which his own annihilation would leave untouched. Science, as it thus tends to confirm the conclusion of the syllogism by which the existence of the material world is sought to be proved, gives considerable weight to the process by which the conclusion is arrived at; such a process being the only possible one. It therefore tends to confirm the parallel reasoning by which the existence and nature of the First Cause is deductively established.

16. But here we must remark that the two arguments, though parallel, differ considerably in value. The argument for the reality of the external world requires to its validity the assumption of the Law of Parcimony. That finite intelligence requires as its cause an infinite intelligence must be true, if causality be admitted to be universal. But that sensation has a material ground requires for its proof the logical principle, that a greater cause must not be assumed where a lesser will meet the case. The hypothesis of an Intelligent Creator accounts for our sensations as it accounts for our existence, and it is only upon the principle of the Law of Parcimony that we seek for a simpler, that is, a second-

any cause. That this is so, is shown by the fact that while all philosophers who have admitted universal causation have maintained the existence of a First Cause; many who admit this principle have, nevertheless, questioned the reality of the external world. In illustration of this we may contrast the intellectual scepticism of Kant and Berkeley. Kant, denying the objective validity of causation, questions on the one hand the reality of the external world, and on the other hand maintains that the existence of God cannot be the subject of an intellectual demonstration. Berkeley, on the contrary, admitting causation, finds in God's existence a sufficient cause for our sensations, without assuming, what he views as a self-contradiction, a something which is not mind, and which is, nevertheless, conceived to stand in relation to mind.

Thus, as the existence of the material world is demonstrated by a syllogism parallel to that of our argument, though it be weaker for the reason which I have explained, the ever-increasing probability which Science lends to the truth of the conclusion in the one case, confirms the correctness of the process by which in each case the result is arrived at.

17. It may be said, however, that the cases differ in this important respect—the assumed existence of an external world is brought to that test by which all hypotheses must be tried, agreement with all the observed facts. The existence of God, however, is an hypothesis incapable of such a proof, and therefore of any. It belongs to one of the classes of illegitimate hypotheses. Now we must admit that in a sense this is true. The assumption is not capable of the same rigorous verification as those of physical experience,

but it would be a mistake to suppose that it was entirely without any corroboration of this kind. Had this been the case it could not have obtained, or continue to possess, that hold upon the convictions of mankind which we know in fact that it has. This is not the place to enlarge upon its conformity with the requirements of the moral nature of man, nor its harmonious agreement with the sense of dependence which is the emotional form of the consciousness of our finite and changing existence. This is an evidence which is individual and personal; it is all the more convincing upon that account. "Le ^{Pascal} "cœur a ses raisons, que la raison ne connaît pas."

What we are here concerned with is the question whether the facts of Nature are found to confirm or to refute the belief, and to this we will now direct our attention. Viewing then, for the present, the existence of an Intelligent First Cause as an hypothesis, we shall endeavour to test it by comparison with the facts which Science unfolds to our view. What has been demonstrated in the early part of this treatise by deduction, is now to be tested by the reverse method.

The most striking impression which a survey of the History of Science leaves upon the mind is that of its tendency toward unity. This is indeed a subjective characteristic of all thought; but what is here of importance to observe is this, that Science shows the same to hold good, in an objective sense, of matter and material existences. Progress in Science means simply advance toward unity. Explanation, its aim, is but the setting down of a particular event as an instance of a general law, or the reduction of many narrow laws to one of wider comprehension. As thought leads from intuitions to conceptions, and from conceptions to wider

and wider generalizations, so is it with nature as exhibited by science. The vast sum total of individual facts is shown to be the result of laws necessarily fewer in number than the instances which reveal them, and again these laws are shown not to be ultimate, but to be themselves derivative—to be in themselves results of simpler and wider principles, still fewer in number. And so on in a series constantly advancing from complexity towards simplicity, from plurality towards unity.

The progress of Science is a constant convergence, and this tendency is strikingly illustrated in the most important discoveries of recent Science. A few of these may be considered in this place by way of illustration.

18. Our knowledge of the nature of matter, for example, has been advanced in a wonderful manner by the ingenuity with which the Undulatory Theory of Light has been made use of in prosecuting the investigation. By passing a ray of polarized light through translucent substances, and examining the condition of the ray after its passage, much insight has been gained into the geometrical arrangement of the ultimate particles of things. "The transparency or opacity of a body appears to depend entirely upon its molecular arrangement." As an instance of how this principle may be applied, the following experiment may be given. A ray of polarized light will pass through a sheet of tourmaline only when the sheet is placed at a certain angle with the plane of the ray's vibration. The ray is passed through a solution of sugar and water, and the position in which it is found necessary to place the tourmaline now, in order that the ray may pass through it, is found to be different from what it was before. It appears from this that the plane of vibration of the ray

Grove, *Correlation of
Phys. Forces*,
62.

has been altered in passing through the solution. Now light appears to be a vibration of the something which lies between the ultimate particles of matter. Such an alteration must therefore result from the geometrical arrangement of these particles which retards and sometimes deflects the vibratory movement which is going on between them. It is evident that we have here the means of prosecuting inquiries in a region hitherto inaccessible. Till the present day the notion of an ultimate atom was little more than a metaphysical conception which it seemed necessary to transfer to Physics. It appears now to have become, to some extent at least, a legitimate object of science. The actual atoms still escape us, it is true; but not only has much light been thrown upon their modes of arrangement in various substances by such experiments as the one we have mentioned, but some advance has been made towards a physical, as distinguished from a metaphysical, definition of them. They are viewed now as centres of force—repulsive as well as attractive¹. These centres need not necessarily possess extension. That is the property rather of their sphere of action than of themselves. This extension of scientific analysis to the nature and modes of grouping of the ultimate elements of material being, appears to promise an advance in point of simplicity which is greater, no doubt, than we can at present realize.

The same progress towards greater simplicity is the tendency of the results which have been arrived at by the analysis of the Prismatic Spectrum. The spectrum is found to vary in certain lines (to which Fraunhofer has given his name), according to the chemical nature

¹ This view has been anticipated by Kant in his *Metaphysical Elements of the Science of Nature*.

of the substance by whose combustion the Light is produced, or through which it has been transmitted. The applications of this discovery have been very varied. It has been made use of in investigating the constituent element of the Heavenly Bodies, and the result is an advance, in the direction of simplicity, in two different ways. It has shown us, first of all, that the Universe, as far as we can examine it, is composed throughout of the same simple elements. It has also suggested, if it has not yet proved, that some of the elements which we have hitherto considered as primary, exist in a decomposed state in other planetary systems. The tendency of both these discoveries is to reduce to a smaller number the original elements of matter. How far the reduction will go it is impossible at present to say.

In the investigation of Force the progress towards unity has been still more striking. Starting from the principle which Davy laid down with respect to heat, "that its immediate cause is motion, and the laws of its communication precisely the same as the laws of the communication of motion," the observations of Joule, Rankine, and others, have established beyond a question its dynamical nature. Joule also did much towards proving the identity of Electricity and Heat; and the labours of Ørsted, and especially of Faraday, have left little room for doubt upon the point. To Faraday is due the discovery that Magnetism will produce Electricity; and the discovery of Photography has shown the connection which exists between Light and chemical affinity. These and similar discoveries have established an almost completed proof that Force is one; that all the various forces which operate in nature are but

forms of one great principle; and that any one of them may, under proper circumstances, be converted into any of the others. Here again we do not yet know how far this Unity may be found to extend. We are promised by Prof. Tyndall a work, which will show the virtual identity of all forces, organic as well as inorganic.

In astronomy the Nebular Hypothesis of Laplace and Herschel is another striking instance of progress in simplification. The complexity of the Solar System, and its method, are both in a great measure explained by the theory of its nebulous origin; and facts which at first sight appeared to be exceptional, and to conflict with the theory, have been shown to do so only in appearance. Laplace alleged as evidence of a common origin that the planets all rotate upon their axes, in the same direction as that of their revolution round the sun, and on axes, roughly speaking, perpendicular to the plane of their orbits. Since he wrote, however, it has been discovered that the satellites of Uranus and of Neptune do not revolve in the same direction as that of the planets' annual motion; and as the rotation of the planets is in all probability in the direction of the motion of their satellites, an exception to Laplace's rule is established, which might appear to conflict seriously with his theory. But considerations drawn from the probable forms of distribution of the nebulous matter at distances very remote from the centre of the system, have led to the belief that the rotation of the planets in the same direction as that of their orbital movement, though a probable result of a nebulous origin, is not in all cases a necessary one; and the examination of these apparent exceptions has only served to place the theory upon a securer basis.

In the investigation of the origin of life some progress has been made, though no very important results have as yet been reached. The theory of spontaneous generation appears to be finally abandoned; and as this tends to remove an objection to the identity of all Life, it is so far a step towards greater simplicity. But as regards the development of Life, Mr Darwin's works have made an immense step in advance of previous speculations. His theory of Pan-genesis is conspicuously a step towards unity. Nothing appears at first sight more complicated and less reducible to law than the indefinitely varied forms of vegetable and animal life, with which our world abounds. It seemed quite out of our power to account for the existence of certain races, and the non-existence of others, equally possible—physiologically. Here we found a series of closely allied species—there a vast gap. Here a genus containing numbers of species, differing among themselves but slightly—there, one of which the species were few and divergent. It seemed impossible to say why, out of innumerable potentialities, these rather than those had become actualities. Lamarck and others had, indeed, conjectured the common origin of all forms of vegetable and animal life, but the theory was a mere guess, until the appearance of Mr Darwin's great work—the result of twenty years of study and verification—gave a clue to the solution. By the grand conception of a struggle for existence, necessitated by the geometrical ratio in which life, unchecked, increases, he proposed to account for the divergence of the forms of life. That variation occurs naturally is obvious to any observer, but Mr Darwin's brilliant hypothesis shows how these accidents, taken advantage of in the great struggle, give rise to permanent

varieties, and so to species; and thus the standing marvel of Physiology appears to be explained. This is by far the greatest step towards unity which recent Science has made.

19. In these and in numerous other instances the advance of Science is seen to have unity as its aim. And this may be shown to be a strong confirmation of the hypothesis which we are engaged in testing. For in the first place it shows us that the demand for a First Cause is a perfectly justifiable one. Science urges incessantly its *why* in the sphere of existence with which it has to do, and the result of its persistent questioning is an ever-advancing knowledge. Why then shall a principle so fruitful of results in the world of being, which is known to us only indirectly, be denied to us in the case of the one existence of which we are intuitively certain. That which has produced so vast results when applied to the external and hypothetical world, may be expected to yield results far more valuable when applied to the one reality which is to us unquestionable. Applied, as it has been, to the external world, it leads us unmistakably *towards* unity: applied to our own being, it leads us *to* unity itself, to the one Infinite and Intelligent Creator. Again, in each step of Science the simpler, wider fact is seen to contain the lower; it is the very principle of its progress that nothing is left unaccounted for; an hypothesis which fails to account for the whole of the facts is at once rejected as imperfect or false. A cause, or group of causes, which does not contain *in posse* all that the effect presents to us, is declared at once to be wanting. It is either no cause at all, or there is some element contributing to the effect, which it does not include.

Now it is upon these two principles, the imperious

necessity under which we lie of pressing the question Why? and the impossibility which we experience of resting satisfied with anything short of a complete and adequate answer, that Science and Natural Theology alike are based, and in each case the goal towards which the process is seen to tend is unity.

*Critique of
Pure Reason,*
p. 374.

We may here remark that this characteristic feature of Science has a bearing upon one of the objections which Kant has raised to the argument which we have developed. The inference of a First Cause assumes, says he, "the impossibility of an infinite ascending series of causes." The manifest convergence of the various systems of causation which Science exhibits to us, seems to indicate that in the material world at least such a series does not exist. However far beyond anything that man can ever grasp, that centre lies in which all things meet, it is toward a centre that all his knowledge tends; and indefinitely vast as the stupendous scheme of Nature must be, Infinity is the property not of it, but of its cause.

20. At this point a very important consideration presents itself to us. The oneness at which Science is aiming, it is seen more and more clearly to be unable to attain. At a time when Science was in a less advanced state than it now is, it might have appeared to an observer of its tendency and its success, that it would in process of time actually attain to the one central principle of which all laws and all facts are the evolution. Many thinkers did, in fact, accept this as a probability, and a few went so far as to deem it a certainty. It is one of the most remarkable features of the recent history of Science, that this view is now generally abandoned. The nearer we approach by scientific methods toward

unity, the more clearly do we see that unity cannot, in the nature of things, be reached by that path. The One is seen to be inaccessible to Science, although in the One alone can its questioning be laid at rest, and its system attain its ideal completeness. It becomes clearer, as we advance, that the ultimate result of analysis (even if it can be reached) will give us not oneness, but only simplicity; not one principle, but a few. The last result of Science must be plural, it may be dual, it cannot be singular.

21. The most abstract physical speculation gives us, of necessity, two elements, Matter and Force. Neither can of itself account for the facts of the Universe. Neither can by its very nature be resolved into the other. The correlation and virtual identity of forces, the proved oneness of force, only brings out into clearer light its antithesis to matter. We are, if possible, more certain than we ever were that the two are opposite and complementary. Again, these two elements, though sufficient for the abstract consideration of the question, are not enough *practically* to account for the facts, until we add another item. Force can only act under circumstances favourable to its action. There must be assumed to account for the facts of the universe as we see them—in addition to Matter and Force—initial circumstances. Here then several distinct elements appear as the result of our analysis.

22. Similarly as regards the nature of chemical substance. We cannot analyse it into less than two elements. Beside the ultimate atoms of which it is composed, we must assume that the particles are invested with certain forces acting upon each other. We cannot assume either alone, nor can we resolve the two facts into one. Nor does it appear possible to account for the pheno-

mena of chemistry as we see them in actual fact, unless we assume more than this. The ultimate atoms must be held to differ either in themselves, or in the affinities with which they are endowed.

23. Recent speculation has suggested a further addition to the primary elements of chemical bodies; beside the simple material atoms and their several affinities, there seems some reason to suspect the existence of another substance. Between the particles or monads of which matter is held to be composed, there must be interstices. Are these interstices really void, and are the vast expanses of space in which no worlds exist absolutely empty?

The undulatory theory of light requires that we should answer these questions in the negative. The vibrations of light are clearly not motions of the particles of matter, but motions which pass through the interstices of it¹. On no other theory can we account for many of the phenomena of translucency; such, for instance, as the frequent connection between crystallization and the transmission of light, the effect producible by compression on the transparency of glass, the fact that tourmaline and some other bodies will transmit polarised light in one plane only, and the deflection of the plane of polarisation produced by the passage of the ray through certain translucent liquids, of which we have already spoken. Now if there be vibration there must be a vibrating medium, and this consideration has led to the theory of an ether pervading all space, and filling the interstices of all material bodies. This notion is suggested by Sir Isaac

¹ Mr Grove questions this (in his *Correlation of Physical Forces*, p. 63 of the Second Edition), but it is now, I believe, generally admitted.

Newton in two remarkable passages—one in the *Principia*, the other in the *Optics*. The undulatory theory of light has given to the suggestion thus thrown out an additional probability, and it is considered by some¹ that the assumption of such an all-pervading substance is necessary in order to account for the cohesion and solid structure of bodies. If such a medium really exist (and the supposition is beset with difficulties) not only is the number of primitive elements increased by its reception, but analysis applied to it must yield, as before, a plural result. It must itself consist of particles, or how can it possess elasticity? and these must have their law, which in this case must be one of repulsion. We have thus, if the theory be true, a substance other than matter, and a principle complementary to gravitation. In each case unity escapes us, as we seek to grasp it.

Principia,
Bk. III.
Scholium
Generale.
Optics, Bk.
III. Qu. 18.

24. The same truth may be illustrated by the theory of natural selection, by which the development of life is sought to be explained.

This does not give us, as the earlier maintainers of pan-genesis attempted to do, one germinal principle of development, but it shows us that the observed facts are the result of three laws: That life increases in a geometrical ratio; that there is a persistence of type; and also a tendency to variation. Were any one of these wanting, organic existence would not be what it is.

25. Another instance at once of the tendency of Science towards unity, and of its inability to reach it, I may be allowed to refer to, although it is not, strictly speaking, within our present sphere. It is that afforded by the history of modern speculations upon the nature

¹ As by Mr. Birks, *On Matter and Ether*, p. 9.

and origin of the moral element. An attempt has often been made to derive the moral sense, as well as the Laws of duty, from the single principle of Self-love; to show that from this is derived both the idea which is represented by the word 'ought,' and also the rule of all of that which ought to be done. This theory was presented in a popular form by Paley, in the interest, as he conceived, of religion. Self-love, urged to action by the promises and threats which the revelation of a future state of retribution presents, this appeared to Paley the sufficient basis for all morality. The fallacy of the theory was obvious, among other things, from the consideration that the sense of duty often exists where there is little or no belief at all in a future state, and certainly no notion of a future retribution. What Paley had exhibited in this very assailable form, Bentham sought to place upon a securer basis. He thought to found upon the single principle of utility, at once the motive of all moral action, and the rule for its direction. If any one could have succeeded in this attempt, Jeremy Bentham was the man of all others most competent to achieve success. His clear-headedness and power of analysis have rarely been equalled, and his labours in the province of Jurisprudence has placed that science upon a new footing. But the advance of speculation has shown that he was wrong in supposing that one single principle could form the basis of ethics. It has been found impossible to resolve the moral sanction into a simple fear of the consequences which society will inflict upon any one who contravenes the happiness of the greatest number. Not only does this view fail to account for any but the social duties, it fails to accord with the history of ethical progress. The men who have in every age advanced the

standard of morals have been the martyrs of humanity. Defying the popular sanction they have been done to death by the public opinion of their day, and in defiance of society they have preached a higher than the current morality, and by their heroism converted the generation which condemned them.

Mackintosh, though a contemporary, must be considered to have made an advance upon Bentham's theory. He saw that beside Self-love it is necessary to assume a principle of Sympathy in order to account for the phenomena of Ethics. In this he but followed Hume and Adam Smith. His merit, however, lies in having attempted to analyse these principles still further, but the result of his analysis is still not one principle, but two. Besides the Primary interested Desires, which, wisely directed, result in a rational Self-love, he is forced to assume a power of associating thoughts and emotions in an indissoluble combination. On the theory of a mentally inseparable connection between emotion and its outward signs, established by association, he conceived that sympathy might be accounted for. We are not concerned with the truth of his theory. What is of interest to our argument is this—that his system, which appears to be an advance upon Bentham's notion of a Popular Sanction, is a confession that Ethics cannot be resolved into one principle. A more striking example, in the same department of speculation, is afforded by a comparison of Mr Mill's Utilitarianism with that of his Master. The instance is the more valuable because Mr Mill does not appear to be conscious of his divergence from the simplicity of his teacher. He accepts Utility as the test of the moral value of actions, but he does not stop here. He does

*Utilitarian-
ism*, p. 42
(3rd edition).

not endeavour, as Bentham has done, to resolve the motive of moral action into its utility to the individual himself. He does not adopt the Popular Sanction as that which gives to the principle its practical validity. The answer to the question, why we should act upon considerations of general utility, he declares to be, the existence of certain emotions, which with the pure idea of duty make up conscience. The real Sanction, he says, "is the conscientious feelings of mankind." It is interesting, and of value to our argument, to observe one who so eminently represents the tendencies of modern speculation, thus falling back upon a dualism which his school had rejected, in favour of an ingenious but fanciful unity.

I have dwelt upon these examples in order to show, from the direction in which Science has in recent times been moving, that while its tendency is, as ever, towards oneness, both as the subjective aim of thought, and also as the objective centre of the development of all reality, such a unity cannot be reached, in fact, by any analysis, however profoundly pursued. Just as Kant has shown in his *Critique of Pure Reason* that while the whole tendency of thought is toward unity, the ideas, which alone can give it, lie beyond the reach of intelligence, and belong exclusively to the Practical Reason, so, in Science, we learn by its modern advances, more strikingly than ever, that the centre toward which it tends lies, of necessity, beyond its sphere.

26. We turn now to a consideration of a different nature. A First Cause has often been declared in its nature inconceivable, because the notion of a commencement of things is so, and this notion is involved in the admission of a starting-point in the series of

causation. It has frequently been maintained that creation involves a something which the mind cannot grasp; and this fact set up against the opposite truth that we cannot imagine an infinite series, is dwelt upon, not only as showing the limited nature of mind, but as proving that a religious system which requires of us the acceptance of the doctrine of a creation, demands an intellectual impossibility. Such a demand is certainly made upon us, by the assumption of an Intelligent Infinite Cause of all things, but it is necessary to understand clearly to what extent.

The inconceivability which attaches to the notion of an absolute commencement seems to me to concern, not the beginning of limited and finite existence, but that of existence in the abstract. It is not difficult to conceive of a commencement, in the sense of evolution. On the contrary, this is a fact of hourly experience. Every change in our own subjective mode, every new phenomenon which presents itself to our experience, implies the notion of commencement. What is really unthinkable is a beginning of Being in general, a time (if we may here speak of time) when what now exists actually, did not exist even potentially. This is to conceive of a nothing out of which all things have arisen; and this is certainly an impossibility. But surely this conception, like that of the "unconditionally limited or unlimited," has a value merely logical. Is it not just because they are nothing but logical centres, that they are unthinkable? Can they have any value at all in the world of fact, and is the mind the worse, and not rather the better, for this restraint upon its discursivity?

The difficulty at any rate is one from which the The-

istic theory is free. In viewing the sum total of finite existence as derived from one Infinite Being, the purely logical notion of absolute commencement is expressly excluded. The existence which is assumed as Infinite is by the same assumption declared of necessity to be Eternal. That which is conceived of as the cause of all things cannot be itself an effect. And that which nothing can antecede or succeed is infinite in duration as in efficiency. The thought of a commencement of Being, which the mind is certainly incapable of forming, is not required by religion, on the contrary it is expressly excluded. The commencement of limited and changing existence is a thought which the retrospect of our life obliges us to entertain, and which our wakening up to consciousness after a dreamless sleep presents to us again and again. We may add, too (though it is beside our immediate purpose), that by the same theory the difficulty of an infinite retrogressive series is equally excluded. Infinite Being is denied by the very nature of the case to be subject to change. In Him time, that is, succession, must be considered as non-existent. He must be thought as existing in an Eternal Present; and to this conception we need the assistance neither of memory nor of imagination. The past and the future, as conceptions, are full of difficulty and paradox; one tense only is clearly and unmistakeably intelligible—the Present.

27. But although the logical notion of an absolute commencement is thus excluded, there is unquestionably involved in our hypothesis the secondary and empiric difficulty of a commencement of the Physical Universe. The observation of the rigorous uniformity of nature, as we see it, has tended all through the history of science

to create in the minds of some who studied it, an impression that her laws are eternal. There has been a tendency to erect into a God, the sum of the principles on which things depend, and by which their development is directed. It has seemed possible, nay inevitable, to regard the universe as a machine of perpetual motion; and while some have maintained that the machine had indeed a contriver, but once started needed no more his care, others have felt no need to seek for its origin at all. They have been content to accept the fact itself as ultimate, and to view nature as containing in itself the principle of never-ending movement and vitality. It is essential to this view that the history of the development of the universe should be, not a progress, but a cycle returning upon itself, and recommencing again from the same starting-point; and there is much at first sight, and in an early stage of scientific knowledge, which would seem to countenance this hypothesis. But the rise of the science of geology, which reveals the past history of our globe, and the theory of Laplace which has done the same for the Solar System, has shaken the theory in the earlier form which it assumed; and there are not wanting signs in some of the more recent physical speculations, that even in its more abstruse form it will be found to be untenable. No one can examine the conclusions at which Sir William Thomson arrives in his remarkable treatise *On a Universal Tendency in Nature to the Dissipation of Mechanical Energy*, without being struck with their bearing upon the question which we are here considering. In this treatise, as also in his unpublished Read Lecture and in parts of the *Treatise on Natural Philosophy*, it is shown that the tendency to the conversion of motion into the form of heat is not coun-

Tait and
Thomson's
Nat. Philosophy, i. 277.

terbalanced by any adequate tendency to re-conversion. Both by tidal friction, and by the resistance of the medium through which they move, the planets of our system are shown to tend to a slower and slower movement, the result of which must be "the falling together of all into one mass, which although rotating for a time must in the end come to rest—relatively to the surrounding medium." This loss of energy is due to the radiation of the heat produced by friction, and the same must hold good therefore of all motion throughout the universe. It appears from this that Force tends everywhere, however slowly, to become transmuted from molar into molecular, to lose the form of motion and to assume that of heat; and this heat diffused through space will cease to give birth to energy in any form whatever. If these conclusions be correct, the notion of an ever-repeating cycle must be given up. When the solar system, and after it slowly but surely the vast aggregate of the material universe, has reached the end to which it is thus shown to tend, nothing short of a change in the existing laws of nature will produce any new genesis of motion. Energy will exist potentially, but the circumstances necessary to give it actuality can never arise. The more this marvellous thought is dwelt on the more clearly do we see that one very serious empirical objection to the truth of natural theology is by this discovery removed. For its range is not prospective only; it obliges us to look backward as well as forward, and to consider the beginning of the series of physical events of which it shews us so decisively the end. If all known laws tend to the final conversion of motion into the form of universally diffused heat, we cannot but ask, Whence that concentration of heat in definite centres by the

gradual dissipation of which motion is at last to cease? If no known laws can convert again into motion force which has finally assumed the form of diffused heat, the question is forced upon us, How is it that energy does exist? how is it that force came in the first instance to exist as motion at all? Whence shall we account for a fact which nature's present system has no means of reproducing. It is necessary to the position of the physical atheist, that Nature should contain in itself the principle of its own reproduction. Only on this assumption is he justified in declining to seek for a cause external to her. He would wish to view nature's history as illustrated by the motion of a pendulum, in which its own movement in one direction places it in the position favourable to the action of the force which is to cause the returning swing. But the analogy would now appear to be closer than his argument can admit. The successive movements of a pendulum are not equal; little by little the force is dissipated, and at last the movement ceases altogether unless it receive from without a new impulse. So with nature, these recent investigations direct our thoughts to a limit, an end, a beginning. We are not forced, of necessity, to think that no state of things existed previous to the present economy; but we are led to see that, to the production of the conditions under which the present system took its commencement, forces must have contributed distinct from any which are at present known to exist. We may imagine, if we please, a state of things preceding the present, in which the equilibrium aimed at by the then existing laws was one of concentrated heat. We may fancy this if we please, but we cannot get over the fact that between that state of things and the present a change, amounting to

a reversal of some, at least, of the previously existing laws must have taken place. That which has appeared so eternal, that a god seemed an unnecessary hypothesis, is thus shewn to be by its own principle limited in duration. The universe appears, in the light of these discoveries, not as a machine of perpetual motion, but as a clock, whose movements take their origin from a force communicated to it from without, and which when that impulse is once exhausted subsides again into rest.

The importance of this discovery can hardly be exaggerated. Its bearing upon the argument from design we shall discuss in our Second Part. What we here have to insist on is, that it not only removes the objection to a supposed commencement of things, which the fancied equilibrium of natural laws has created, but it obliges us to admit, as far as concerns the forces with which matter is endowed, that there has been a beginning. It shews us that the present state of things is not a cycle but a progression ; and by exhibiting in the remote past an initial state of things, which the present laws of nature are not only incompetent to produce, but even permanently to maintain, it leads us unavoidably to the supposition of a something beyond nature. It shows that there must be external to her a cause adequate to the production of a state of things which her laws, as they now are, could not bring about, or at any rate a cause capable of effecting that reversal of previously existing laws by which the climax of a former economy became the starting-point for the present.

PART II.

I. LET us here pause and survey the position at which in the consideration of our subject we have now arrived.

Rejecting the first of Kant's three arguments of Natural Theology, as wholly inadequate to the demonstration of real existence, I have dwelt at large upon the second, which he has named the cosmological. I have developed it with such care as was in my power, and I have endeavoured to shew how Science has contributed in many ways to confirm its method and its conclusion, and to remove the suspicion of its validity which Kant's severe criticism has produced.

There remains to be examined the third—the Physico-theological argument. This we shall now proceed to discuss, as it is affected by recent scientific discoveries. It will be seen, from the principle which was laid down at the commencement of the inquiry, that I view this argument as entirely subsidiary to the other. I believe that the existence of a First Cause can only be satisfactorily proved from the existence of ourselves, and that His Intelligence is most readily demonstrated from the fact of our own. As we cannot admit that the existence in the mind of the conception of an absolutely necessary

being—the idea of the *ens realissimum*, the sum-total of all reality—affords any demonstrative proof of the reality of such an ideal, so on the other hand I am not prepared to attribute to the argument from final causes any very strong logical cogency. It is from the knowledge of our own intelligence, and of the manner in which we contrive to arrange the elements and forces which nature puts within our reach, so as to serve our own purposes, that we derive the notion of design ; and the application of this conception to the facts of the external world is attended with difficulties, which do not meet us in the reasonings which start immediately from the facts of consciousness. We may here remark one advantage of founding our main argument not upon being in the abstract, but upon our own. The fact of a discussion renders it necessary to admit the very point upon which such reasoning is based. The question whether evidence of Intelligence can be discovered in the works of nature, we may decide one way or the other, but the power to discuss it, and the fact that the terms which we use convey to us any meaning, proves of itself that fact of the existence of intelligence (to wit, our own) upon which our main argument is grounded. We who exercise intelligence in debating the question, and who have therefore some comprehension of what the word itself means, are called ourselves into court as witnesses. The man who denies that in nature any evidence of design can be detected, cannot be convicted of palpable absurdity. We may establish a considerable probability that he is wrong, and that is all, but he cannot discuss the question without admitting that he understands the terms which he employs. He must allow that what he denies the evidence of without, he exercises within. He

must admit that his denial means just this—that he is unable to see in external nature any evidence of that which he knows to exist in himself; and thus he cannot attack the argument from design without contributing to the force of that from existence.

2. Of all arguments for the existence of a God that from design has ever been the most popular; on the other hand, it is the one in refuting which the atheist has always met with the most success. The two facts, though opposite, appear to be due to the same cause.

It is a habit, common to learned and unlearned alike, to think and speak of nature as a something of which we do not ourselves form a part. The universality of this mode of speaking is evidence of the practical force of Idealism. In a metaphysical point of view nature and ourselves, the Ego and the non-Ego, are antithetically opposed. We are to ourselves of primary and unique importance; all that experience reveals to us is but secondary to the fact of experience itself. However profound our study of phenomena, the matter of supreme interest to ourselves is this—it is *I* who study. In practical life, however close and intricate may be our dependence upon external things for all that constitutes our material, nay, to a great degree our mental well-being, we can never by any possibility lose sight of the fact, that we and they are utterly distinct. But when from the metaphysical point of view (and practical life has its practical metaphysic) we turn and contemplate things from the physical stand-point the case is changed. Here we must endeavour—however artificial be the attempt—to forget that it is we, who are observing. We must aim at viewing nature as from without, and learn to regard ourselves as but a portion of her. We must

consider ourselves simply as phenomena, to be classed in our system of things solely according to the properties which we observe ourselves to possess, and we must learn to discuss, with entire impartiality, the proper position in nature of the genus man, ignoring, as much as we can, the fact that it is we men who have to decide the question.

It appears to me that the argument from design is popular, because the metaphysical view is more natural than the physical, because observation is easier than reflection. Observation is the first of all mental processes; it is manifested in the child and the savage. Reflection, on the other hand, is the work of a maturer and more developed state. It is to most minds an uninviting process; the art of dissipation has been invented expressly to guard, as far as possible, against it, and we have professions devoted to this purpose alone. Very few men are capable of carrying it far, for it demands not only high mental powers, but also an inward quiet which few possess. Hence it is that arguments derived from external nature are generally preferred to those more solid and profound ones which reflection alone can yield.

3. It is this metaphysical distinction of the external and internal worlds, imported by a confusion of thought into physical speculation, which enables the atheist not unfrequently to achieve an easy and popular victory. The facts of nature have been looked at apart from the facts of mind, which, in this point of view, form a most important branch of them. That notion of contrivance and design, the application of which to physical facts constitutes the argument from final causes, exists first of all in the mind itself. Man has been defined as the

tool-using animal; and it is certain that those who have attempted to apply the conception of end and means to the solution of the wonders of the physical world, bear no proportion at all to those—the whole race in fact—who are habitually applying the principle of design to practical concerns. The existence of the notion is, strictly speaking, a fact of nature; and though the evidences of its application to the sensible world may be denied, yet as a real principle of the human mind it demands an adequate explanation.

It has too often been overlooked, that intelligence, reason, conscience, are as much phenomena of nature as light or heat; and it has thus been easy to deny the evidence of intelligence in nature's works, when that department, in which it is most clearly manifested, has been artificially excluded from the survey.

4. I cannot go so far as Sir William Hamilton in depreciation of the evidence of intelligent design which the material world presents. He considers that it is in the phenomena of mind alone that such evidence is given; and he adds, that the phenomena of matter, taken by themselves, "so far from warranting any inference to the existence of a God, would, on the contrary, ground
Lectures on Metaphysics, 1. p. 26.
"even an argument to His negation." I shall endeavour to show that, though the evidence is in its nature such as establishes not a demonstration, but only a probability, it is yet such as we cannot afford to overlook; and further, that while Physical Science has shown many of the more obvious arguments to be worthless, it has suggested others deeper, and more trustworthy, derived both from the general character of nature which it unfolds, and also from some of the particular facts which its investigations have brought to light.

*Critique of
Pure Reason*
(Bohn),
p. 383.

Ibid.

5. The argument from design is frequently used, as if it tended to establish the *existence* of a God. Thus it is classed by Aquinas¹ as the last of the *a posteriori* arguments to establish the Being of God; he styles it "argumentum ex gubernatione rerum;" and Kant places it among the three proofs directed to this end, which he discusses; and he considers it the most respectable of all, as being "the oldest, the clearest, and that most in conformity with the common reason of humanity." I, nevertheless, cannot but think that it ought to be viewed rather as dependent upon what he calls the Cosmological argument, and that the position in which, contrary (as I think) to strict logic, it has been placed, is the cause of much of the distrust with which the reasoning has been viewed by philosophers of very different schools; by Descartes, for example, as well as by Hume. From existence alone can existence be proved; and I believe that the argument from design would have been less rudely handled if it had been viewed as contributing to establish, not the existence, but the Intellectual Character of the cause of all things. Thus regarded, the judgment of Kant applies with great truth and propriety. "Al-though," he says, "we have nothing to object to the

¹ In the form in which St Thomas puts the argument it is directed rather against the hypothesis of *chance*, than against either scepticism or materialism. "Videmus quod aliqua, quæ cognitione carent scilicet corpora naturalia, operantur propter finem, quod apparet ex hoc quod semper aut frequentius eodem modo operantur, ut consequantur id quod est optimum. Unde patet quod non *a casu*, sed ex intentione perveniunt ad finem." (*Summa Theol.* I. q. 3, art. 3.) In this form it is mainly an argument from the uniformity of nature, against a theory of chance and accident, and seems adapted to establish the existence in nature of Laws rather than that of an external Lawgiver.

"reasonableness and utility of this procedure, but have
"rather to commend and encourage it, we cannot ap-
"prove of the claims which this argument advances to
"demonstrative certainty, and to a reception upon its
"own merits, apart from favour or support by other argu-
"ments." It is not until reflection upon our own intel-
ligent and finite existence has suggested to us the thought
of an Infinite Mind, from whom we proceed and on whom
we depend, that we are in a position to do justice to this
subsidiary reasoning. Nothing in nature can suggest an
Infinite Intelligence with anything approaching the force
with which it is impressed upon us by the consideration
of ourselves. Without self-reflection it may be ques-
tioned whether the external world would suggest design
at all; and it is certain that those points which would be
most likely in the first instance to do so (if indeed any
did), are such as a more scientific knowledge shows to be
unfitted to ground any such inference.

The argument in its popular form will generally be
found to be fallacious, as deriving its force either from
our own ignorance or else from the mere complexity of
nature. It may be well to consider for a moment these
two unsatisfactory modes of its application.

Any apparent adaptation of means to ends, any
striking relation of harmony and fitness observed to exist
between an object and its circumstances and conditions,
of the history of which we can give no account, has
been considered by some as an evidence of design.

The argument has too often taken a form of which
the following would be scarcely a caricature. The bed
of a stream flowing through a granite country is observed,
notwithstanding the roughness of the surrounding rock,
to be smooth, and thus adapted to allow the water to

flow past with as little hindrance as possible. To one unacquainted with the frictional force which water exerts, this might appear an example of an evident adaptation of means to ends—the smooth bed to the passage of the stream; but such an argument falls to the ground as soon as ever the force of friction becomes known. When this is understood the history of the relation between the stream and its bed is at once explained, and what appeared an evidence of design is seen to be but the effect of a law.

To take a better illustration: nothing would at first sight appear to shew more direct evidence of intention than the instinct of self-preservation, and the impulse towards the opposite sex, which we observe in the higher orders of animals. These would seem to have as their obvious final cause, or intention, the preservation of the individual and of the race, and might reasonably be considered as implanted for these express purposes by the presiding Intelligence. But this position cannot be maintained, unassailable as it appears at first sight. For it is evident, upon reflection, that only such individuals and such races as possessed these instincts would survive and become permanent species. We may suppose, if we please, at the first commencement of life, numberless organised germs which perished as soon as they came into being, from wanting even in the rudimentary form the instinct or the capacity for taking in food. Similarly in the higher species where generation is a distinct voluntary act, we may imagine numbers of variations to have come into being which have yet failed to produce a permanent race from lacking the sexual impulse. These suppositions may or may not be in accordance with the facts, but they are such as we cannot disprove, and unless we

can do so, they invalidate an argument which at first seemed convincing. The facts would probably shew that the strength of these instincts was of great advantage to an individual and to a race in the struggle of life, and that in consequence of this advantage the rudimentary form of these impulses has been developed by natural selection into the advanced state in which we observe them among the higher orders of animals at the present time.

As an instructive example of the reversal of such arguments from supposed final causes, as are founded only upon our ignorance of the physical causes of phenomena, which advancing knowledge brings about, I may refer to Dr Whewell's *Bridgewater Treatise*. In that Essay the author accepts the theory of the Nebulous origin of the Solar System, and freely admits that the compensations and adjustments, which had appeared at one time to be evidences of intention and design, have now been shown to have been the necessary result of the mode in which system came into the condition in which we now observe it. But when he comes to examine into the bearing of the phenomena of Life upon his argument he changes his position. He rejects as untenable the notion of the common origin of all organised beings, and he proceeds to found upon the adjustments, and apparent contrivances which the structures of plants and animals present, an argument precisely the same in form with that which he has admitted to be invalid in another science. Surely the similarity of the two cases should have made him hesitate to use an argument which depended virtually upon our ignorance of the series of events by which life in its present complicated forms came about. He, of course, denied that such a

series had been proved to have taken place, but unless acceptance of the theory of development could have been shown to be, in the nature of the case, utterly impossible, the argument owed its force only to our ignorance.

Since he wrote, the same fate, which as he describes, had befallen the astronomical evidences of design, has overtaken his own reasonings, from organisation. The belief in the common origin of life has received a great accession of strength from Mr Darwin's theory of the causes of the development of species; and if this theory be true, what seemed to our ignorance contrivance, becomes here, as elsewhere, the result of order and law.

6. In another direction of speculation the complexity of things has been often used as the ground of a belief in design. The fallacy of such reasoning is obvious enough. The most complicated result may flow from the action of a few simple laws. For example, given three bodies in space and assume the law of gravitation to apply, the motions resulting from these few data may be of such intricacy that it is practically impossible to follow them out. How few in number are the laws by the combined operation of which all the complex movements of the heavenly bodies are produced.

7. I have dwelt upon these unsatisfactory forms of the argument because they have created an impression that the method is radically bad. I do not think so. I believe that it is a necessity of the case that the argument should be constantly changing its form, and this very naturally leads man to overlook the validity which at bottom it possesses. The argument is thrown further and further back as Science advances, but it becomes

by that very process the stronger; and as it loses its hold upon that which is derivative and variable, it becomes the better able to lay its grasp upon those elements which are fixed and unchanging.

"The problem of existence," says Mr Spencer¹, "is *Essays*,
p. 298. not solved, it is simply removed further back. The "genesis of an atom is not easier to conceive than the "genesis of a planet." "The most perfect philosophy Hume's *In-*
quiry, Sect.
4, p. 1. of the natural kind only staves off our ignorance a little longer." If, for example, we cease to view each organ as especially designed for the function which it discharges—and the history of the gradual development of each through a succession of higher and higher types forbids us to take this view—we relinquish it only to marvel more deeply than ever at the why and the whence of those principles by which life has been directed, in its continual advance, towards higher forms. We cannot but enquire how it is that the balance of forces should be such as to produce advance at all. If the study of a single organ is calculated naturally to suggest to the mind a deliberate intention and design, is not the evidence far stronger which is derived from the fact that the organ, as we now see it, instead of being produced at once in its present developed state, is the result of an indefinite progression? Can we look at Life in its earliest germs and remember that in these germs is potentially contained all the marvels of order, strength and beauty, which the world of vegetable and animal organisms presents, without being impressed more than ever with the proofs of a Sublime Intelligence. The mystery which in earlier states of knowledge was diffused throughout the whole field of observation is now, more and more, concentrated upon the principles from

which all the individual facts result, and it is not lessened but intensified by the change.

8. These considerations serve to direct our attention to that which is, after all, the most magnificent revelation which Science has given us: to the absolute order and perfect organisation of the universe.

The notion of the whole vast system of things as a cosmos has presented itself to the more profound thinkers of every age. It is probably from logical and *à priori* considerations that this notion first arose. The study of the facts of mind attained to a highly advanced state when Physical Science was scarcely in its infancy, and it was from these facts that the complete order and harmony of physical nature was inferred, where it could not be followed.

That the mind is compelled by its own nature to system and order, became evident as soon as mind became the object of man's study at all, and hence arose an *à priori* probability that the whole scheme of things, of which it forms a part, was animated and directed by the same principle. It was obvious, too, to the deeper thinkers, that external nature lent itself readily to the subjective conditions under which alone observation is possible. Similarities without rendered possible conceptions within. The uniformities of natural sequences corresponded in some degree to the regularity of logical processes. There evidently was not a chaos without, a cosmos within, but the macrocosm responded to and harmonised with the microcosm. But such considerations were not by any means obvious to the ordinary observer. Nature appeared to him to present, among much that was regular and orderly, much that was capricious and fortuitous; and Science has been the result of

the constant attempt, which the character of the human mind rendered necessary, to reduce into an organised whole the isolated and, seemingly, heterogeneous phenomena which the greater part of nature presents. "For thousands of years man has laboured, amid the ever-recurring changes of form, to recognise the invariability of natural laws, and has thus by the force of mind gradually subdued a great portion of the physical world to his dominion. In interrogating the history of the past, we trace the mysterious course of ideas yielding the first glimmering perception of the same image of a cosmos or harmoniously ordered whole, which, dimly shadowed forth to the human mind in the primitive ages of the world, is now fully revealed to the maturer intellect of mankind as the result of long and laborious observation." Thus what was at first a subjective necessity is seen to be also an objective truth. What was conceived to be true *à priori* is now demonstrable *à posteriori*. Hence—"that ever-enlarging and ever-strengthening belief in the presence of law, which accumulated experiences have gradually produced in the human mind. From generation to generation science has been proving uniformities of relation among phenomena, which were before thought either fortuitous or supernatural in their origin—has been shewing an established order and a constant causation, where ignorance had assumed irregularity and arbitrariness; each further discovery of law has increased the presumption that law is everywhere conformed to."

Humboldt's
Cosmos,
commence-
ment.
(Otte's
Transla-
tion.)

Spencer's
Essays,
p. 240.

In this magnificent conception of the universal reign of law we see the most striking mark of a presiding Intelligence. It is of the very essence of the human intellect (and it is of this Intelligence alone that we have

any immediate knowledge) to produce in all departments of its operation unity and order; and the higher the type of mind the more strongly is this peculiarity displayed.

The good man of business, for example, differs from his inferiors solely in this, that he has a greater power of order and method, and can grasp and reduce to system larger and more complicated arrangements. The great artist is the man who can impress upon every detail of which his work is composed that particular character, by which it shall contribute with the most perfect fitness to the completeness and unity of the whole. The good man is he whose rule of conduct is so clear and unswerving, that we may predict with confidence the course which he will pursue under any circumstances in which he may be placed. In all these cases that which is disconnected and capricious is felt as a defect. The man who omits to take account in his calculations of any of the elements which the transaction contains, or who allows a momentary whim to interfere with his deliberately planned schemes, is not a good man of business. The artist whose works contain but isolated beauties, loosely strung together, is but a feeble craftsman. The man whom passion or interest from time to time diverts from the clear and single line of duty is not a good man. The test of advance in intellectual and moral power is the degree to which the subordination of the details to the general conception of the whole has been carried, and the consequent simplicity and orderliness of the resulting action. It has been sometimes thought that the uniformity of nature is rather a difficulty in the way of belief than a help to it. Such a notion must have arisen from a very inadequate idea of intellectual excel-

lence. It appears to me that exceptions to order, could any such be proved to exist, would tend to strengthen the position of the atheist. We have seen that the great man in any department of human life is he who is the most orderly. He is the man in whom there is the least element of caprice, the man whose actions proceed from principles, and are not determined by the accidental requirements of the moment. And that which is characteristic of the higher forms of human intelligence must in its perfection be exhibited by the Divine Reason.

In attributing to the First Cause of existence the character of Intelligence, we mean, of necessity, to predicate a quality alike in kind to that which we are conscious of possessing ourselves. The difference in degree is immeasurable, no doubt, but it is reasonable to assume that that which is highest in the human mind differs less from the Divine, than that which is lower. The broad principles by which a truly great man governs his conduct require, it is true, occasional exceptions. Circumstances arise when *Summum jus* is *Summa injuria*. There are in all men's lives some cases which general principles are found incompetent to deal with. But why? Either from a defective foresight which failed to anticipate a certain conjunction of events, and therefore did not so expand the principle as to cover it, or else from a real inability to attain to a principle wide enough to meet all possible contingencies. But such cannot, from the nature of the case, occur where the Intelligence is infinite. To the All-wise there can be no such inability to frame rules of action (speaking humanly) which may apply without modification to every case which may arise. To the All-seeing every result, from the greatest to the most minute, from the simplest to the most com-

plex, which is to flow from the general laws, and from their interaction, however complicated, are clearly and precisely known. Not a sparrow falls to the ground without His knowledge and His foresight; "all things "are naked and open before the eyes of Him." The magnificent spectacle of order and law which Science displays to our view but reflects the perfection of the Mind to which it owes its origin.

The value of this, the general outcome of the progress of Science, as it bears upon the argument which we are considering, it seems to me impossible to exaggerate. We cannot fail to be impressed by the overwhelming evidence of an intelligent procedure which the uniform order of nature presents. That which is characteristic of the works of man, and in the highest degree of those efforts of his which are the most noble, appears to be the universal character of nature. Caprice, the result of man's weakness, chance, the invention of his ignorance, these have no part in the great scheme of existence. The wider our knowledge extends, the more clearly do we see in the absolute order and unity of the universe the working of the Ideal Intelligence.

9. Another truth which Science enforces is this, that the general principle of all existence is not fixity but evolution. It is a remarkable fact, that simplicity is reached, not only by an analysis of the existing state of things, but also by the process of retracing its history. The two facts are quite distinct. We might be able to unravel the complications of facts, as they present themselves to us, and to see that, however incongruous at first sight, all were reducible to a few simple elements under the action of a few broad laws, and we might yet find no evidence that the elements had ever actually existed

in separation, or even in combinations less complicated than at present, nor yet that the laws, from the interaction of which the complicated uniformities we now observe result, had ever been really in force, distinct and uncombined.

Such an analysis would not be without its value as an evidence of Intelligence. That the scheme of nature should be such, that it is possible to reduce to simplicity and order its apparent complications, has a tendency to suggest, by its analogy to mental processes, an Intellectual Cause; and the view of things thus arrived at is much more favourable to such an assumption than the appearance of entangled intricacy which the world at first sight offers.

But this is not all. Science gives us another truth. It shows us that the simplicity which analysis reveals has been realised in fact. The synthesis by which we mentally reconstruct the complicated whole, as we actually see it, out of its elementary data, is shown to correspond with the actual series of facts which constitute the History of the Universe. The present state of things is now seen to have been arrived at by evolution from simpler states of being; and the progress is still continued. The present is no more a fixity than the past. The whole of nature is in motion, and the motion is an advance. There is an evident progress, from the elementary to the composite, from the simple to the complex. The bodies which now constitute the Solar System present a higher type of the existence of matter than do the unformed nebulous masses from which they originated. The existence of vegetable and animal life is an addition to, and an advance upon, that of merely chemical action, and the history of the develop-

ment of Life is a manifest progress from lower to higher forms of organisation.

No more complete refutation can be given to the dull atheism, which is content to rest in facts as they are and to seek no further, than is afforded by this view of the History of the World. Nature, as science shows her, herself invites us to look forward, and to look back. She urges us to seek for the commencement of that chain of events, the elements of which are seen to be less and less in number and in complication, as we retrace the Stream of Time; and while thus, in the history of the past, she leads us, whether we will it or no, towards that unity, which Science demands and Religion reveals, so, on the other hand, she bids us recognise no capricious chance, but a progress definitely determined in the future, which awaits us, as individuals, and nature as a whole. "That our harmonious universe," says Mr Spencer, "once existed potentially as formless "diffused matter, and has slowly grown to its present "organised state, is a far more astonishing fact than "would have been its formation after the artificial method vulgarly supposed. Those who hold it legitimate "to argue from phenomena to noumena, may rightly "contend that the Nebular Hypothesis implies a first "cause, as much transcending 'the mechanical god of "Paley,' as this does the fetish of the savage."

Essays,
p. 298.

10. Another point which may here be alluded to is one which Chalmers has dwelt upon in his *Astronomical Discourses*. I refer to the initial circumstances, which, as I have already mentioned, it is necessary to assume, in addition to the existence of Matter and Force, in order to account for the development and conservation of Energy. If we assume as our starting point two bodies

endowed with gravity, this force will produce in them no permanent result, will develop no Energy, will be, in fact, as though it were not, unless the bodies are placed at a distance from each other. But if this were all, the result would simply be that the two would fall together, and then would follow absolute molar rest, the only remaining result being heat in a state of diffusion. Again, if we take bodies of equal bulk, arranged symmetrically as regards each other, the same result will follow—the whole would fall together and remain at rest. To account then for anything more than one movement followed by complete repose, we must suppose at the least three bodies, and these placed at unequal distances each from the other. Nothing less complicated than this could eventuate in the very simplest movement of the Heavenly bodies as we now see them.

The origin then of these motions, as far as it can be phenomenally known, is not a unity. Several elements must have combined to render possible the very first step in the progress of which the system, as it now exists, is the result. Matter, force, and, in addition to these, circumstances favourable to the development of energy, such are the fewest data from which the evolution can have commenced. This is not that unity which Science once seemed to offer, but it is a truer and more valuable gift, for it leads us to look beyond Nature, and to see in the fact that Motion continues to exist (upon which alone the possibility of all life depends) an evidence of Intelligence and design which it is hardly possible to evade.

11. The history of Nature's advance, as Science exhibits it, appears to me to lead to a conviction of a directing Mind, far more obviously than any number of

detailed adaptations could ever do. There is a sublimity about the unity of the vast scheme, an order amid indefinite complexity, a preparation beforehand for each successive step in the progress, which stamps the whole as the work of one, whose nature is reflected, however meanly, in ourselves. The method of Creation, though of such transcendent magnificence that it for ever eludes our mental grasp, is yet felt to be of the same character as the procedure of our finite reason, and to resemble in kind, however widely differing in degree, those operations by which we direct the powers which nature puts into our hands, to the objects which appear to us worthy of our efforts. There is nothing self-contradictory, nothing incredible *à priori*, in this conception of a parallelism between finite and infinite Reason. If God indeed exist, then are we the work of His hands; and as the highest existences of which experience gives us any knowledge, we may reasonably be assumed to approach, in some poor and small degree, to the nature of the Author of our being. If the thought of the insignificance of man, of his weakness and his vice, would render such a notion as this presumptuous, there is still another side to the picture. How marvellous is the fact that man, a mere grain of dust upon the surface of one of the smallest planets of one among the myriad systems of the Universe, should look out from his petty centre of self upon the whole scheme before him, and consider all that is, as but one among an indefinite number of possible combinations. That to him the actual, even though that actual be the Universe itself, appears of necessity small and limited, when compared with the potential out of which it rises. That to his mind the real is finite, and that alone is unlimited, which his mind contemplates, and

which experience denies him. Every thought of that little bundle of nervous tissue, which we call man's brain, contains inevitably an infinite term. Man only knows the finite by the procedure of distinguishing between it and the unlimited which surrounds it; and bound as he is to an experience empiric and phenomenal, he yet thinks—the child and the savage, as well as the philosopher—of things as they are. He steps out in thought beyond all that perception has ever given, and dreams of that which he can never know. His knowledge is relative, yet he thinks of the absolute; he knows phenomenally; and yet, marvellous as it is, he knows that he knows phenomenally. Truly if the littleness of man is pitiful, his greatness is somewhat appalling.

These considerations may serve to justify that which has been in every age the conviction of men in general, and of those the most intensely who have reflected most upon the mysteries of man's origin and position. Unless there be a character common to the Divine and the Human, no relation can possibly exist between the two; and God—if indeed He be—would be to us a matter, necessarily, of indifference. Such a conclusion is *prima facie* improbable. As the First Cause, if admitted at all, must be considered as the centre and origin of force, as well as the ground of the existence of that matter upon which force is exercised, so it seems difficult to entertain the idea, without assuming that the cause of conscious, personal, intelligent, voluntary being, possesses qualities which render possible a relation between the cause and that which it has produced. Science at any rate lends no weight to a presumption which belies the facts of man's moral history. The belief in a God has ever been a practical matter. If such a Being exist at all, He has

been felt to be of infinite importance to us. The conviction of His existence has ever called out towards Him the passionate yearnings of the noblest men. A God out of relation to man is the emptiest figment of Logic, intruding itself beyond its province into the world of fact. This relation of similarity, which the orderly development of nature suggests between the character of the creating mind and that of the human intellect, cannot be assailed by arguments drawn from merely logical abstractions; whatever weight it possesses is derived from observation and reflection upon the things which we observe, and this force cannot be diminished by any merely *à priori* considerations.

12. In the evolution of nature from its early and rudimentary state to the condition in which we now view it, we cannot but see, in addition to continuous development, a number of strongly defined stages of advance. However uniform may be the historical progress, there are, practically speaking, points at which *initiation* is suggested rather than transition. However true it may be that the later state is contained potentially in the earlier, its coming into actuality is a definite step in advance. There is no transition possible between potential and actual. There was a certain definite time, an hour, a moment at which life first began to exist upon this earth, up to which instant it could be said, It is not; after which it could be said, It is¹. And

¹ It is so, too, with the conversion, which is constantly going on, of lifeless matter into living matter. Dr Beale says, in a tract published since this Essay was written, "The pabulum does not shade by imperceptible gradations into the living matter, and this latter into the formed material; but the transition from one state into the other is sudden and abrupt. The ultimate particles of matter pass

in this, and the similar cases, it is worthy of remark, that no examination of the antecedent conditions would tend to create any suspicion of the result which was about to flow from them. No study of chemistry would lead us to suspect or anticipate the existence of physical life, if we could conceive ourselves to be ignorant of it. No study of vegetable life would give us any hint that a life might exist, conscious, volitional, automatic, if we did not already know that such existed. No examination of life, as displayed in animals, would lead us to conceive of what has been finely described as, "un être absolu-
 "ment nouveau, incomparable et sans antécédents;
 "une nature radicalement autre que ce qui précédait:
 "l'homme, libre, intelligent, doué d'amour et de parole,
 "qui se met à ouvrir les yeux, à penser, et à dire à
 "l'invisible: Mon père."

Father
 Grady,
*Philosophie
 du Credo*,
 p. 41.

It must be observed, too, that no *historical* account of the transition in such cases is a real explanation of it. Whatever the process by which it has been arrived at, the result is in each case absolutely distinct from the antecedents. No attempted resolution of life into chemical action has any tendency to explain what life really is. Life may be described as "accelerated chemical action" on the one hand, or as "the continuous adjust-
 ment of internal relations to external conditions" on the other; but such definitions evade the difficulty which they are professedly designed to remove. Life remains as inscrutable as ever, and as clearly distinguished from

Spencer's
*Principles
 of Psycho-
 logy*, p. 374.

from the lifeless into the living state, and from the latter into the dead state—suddenly. Matter cannot be said to *half-live*, or *half-die*. It is either *dead or living, animate or inanimate*." (*Protoplasm*, p. 34.)

Cf. Huxley's
Lecture III.
to Working
Men.

the elements which compose it¹. Spontaneous generation of life has, since the investigations of M. Pasteur, become untenable, and it is agreed that the something which we call life can, in the existing state of things, be imparted to matter only by that which already possesses it. How it came to pass that once at least (as Science views it) this rule was broken, and that life was produced from that which is not life, Science is unable to guess. Either the germs of Life have existed from eternity (and we have seen how Science tends to negative this view of things), or the principle which Science has arrived at, though infringed formally in the first origination of Life, was in reality true, there in its highest sense; and Life was imparted to matter from no lifeless principle, but from that which possessed it in its fullness from all eternity. This fact, which experience shews us, that Life can only be derived from that which is already living, becomes the more striking when we consider that life is not a new force but a new direction. If it were a force, the amount of force in the universe would be affected by the rate of population, and the varying numbers of living individuals. It is apparently a something brought in upon the pre-existing forces and elements of nature, and not a mere combination of these under favourable circumstances.

The identity of mechanical and chemical forces, which was started as an hypothesis, has been verified by experiment. We are able to convert the one form of

¹ "Vitality," says Dr Beale, "cannot be a *property* of matter, because it is in all respects essentially different in its actions from all acknowledged properties of matter. The vital property belongs to a different category altogether." (*Protoplasm*, p. 74.)

force into the other, and we now see that nature is constantly doing so, though we did not before realise the fact; nay, men have themselves been doing so for ages without ever reflecting upon the significance of what they were about. It is very characteristic of real discoveries that once made, it is difficult to understand how they could have lain hid so long: they appear so evident, so simple, and they colligate whole groups of phenomena which have been known for ages as isolated facts. It is the absence of any such character, which marks the attempted identification of life with chemical action as a failure. No attempt to produce life has ever succeeded. The most advanced upholders of the theory assume the unphilosophical roll of prophets, and seek in a possible future what they are confessedly unable to realise in the present. As I do not propose to consider the bearing upon the argument from design, of the history of science, as it is unfolded in such prophetic utterances, but confine myself to the firm ground of actual fact, it is sufficient to observe that the hypothesis has no support from experiment, that it does not agree with any phenomena of general experience, that it colligates no known facts, and by giving to chemical force an indefinite extension, it produces not simplicity but confusion. According to all that Science has actually demonstrated, the view of life, as a something which directs chemical force, seems to be the most tenable. It would appear to be an addition to, rather than an extension of, force; and its introduction, at however early a period of the world's history it may have occurred, is one of those marked advances which cannot be explained away or ignored.

This view of life as a *direction*, finds a remarkable

Aquinas, lib.
11. dist. 25.
qu. 1.

parallel in the theory of the human will propounded by Aquinas, by whom the real force of will is considered as the exercise of divine spontaneity, but the direction of it as the province of the human autonomy." "In libero arbitrio (Deus) hoc modo agit, ut virtutem agendi ei ministret, et ipso operante, liberum arbitrium agat; sed tamen determinatio actionis et finis in potestate liberi arbitrii constituitur." As the human determination of the direction of the will is a necessary postulate of ethics, so the admission of a direction of chemical and other forces external to them, appears to me to be a necessary assumption of Biology.

13. A similar *saltus*, so to speak, occurs where animal life first comes upon the scene. Its characteristic is consciousness. A vegetable is an animal unconscious—an animal, a conscious vegetable. That this, and not volition or locomotion, is the real distinction between the two forms of life, may be shewn thus. The motive which leads the animal in the most rudimentary state to imbibe the food which presents itself to it, is evidently purely instinctive. In some cases everything available is taken in, and no distinction is made between food and that which is of no service to the organism, and which has afterwards to be rejected. Now in vegetables in all forms there is this tendency to imbibe that with which they come in contact, and rejecting the unsuitable elements, to absorb the appropriate. This determination of the organism to absorption is the very law of its existence, and it is this—consciously realised—which constitutes the appetites of animals. The will in animals is determined evidently in the same way as is the tendency of the plant, at one moment to absorb, at another to eject. The difference lies in the consciousness of the procedure

which the one has, and the other has not. Again, as to locomotion, the earliest forms of animal life appear as unable to direct themselves toward the food which they need, as are the simplest vegetables; whether there be actual locomotion or not (and locomotion occurs with vegetables, as for instance, with many of those which grow in water), there is no voluntary action, no locomotion with an aim. On the other hand, we see in the higher forms of vegetables, locomotion (however slow) determined by what, in an animal, we should call a motive. The continued energy which constitutes the life of a plant is supplied to it in a radiant form from the sun, and the plant has always a tendency to grow in the direction of the source from which it derives a renewal of its vital energy. It is to this that the upward growth of forest-trees is due, and very curious examples of this tendency may be found in the case of plants growing in a chamber to which light is admitted only by one very small aperture. Now this movement in the direction of light differs principally in the absence of consciousness, from the movement of an animal in the direction of its food when perceived. What is unconscious determination in the one case, is realised as a motive, and a voluntary action in conformity with the motive, in the other. In the step between animal and vegetable life we have, as in the origin of life itself, a something *added*; a something brought in upon the previous elements, the germ of an entirely new series of developments, which the former state of things did not present, and of which it would have failed to give us the smallest hint. "Infants are sometimes born without "any cerebrum or cerebellum"—without, that is, the organs of consciousness and thought; "and such have

Cf. Tait's
Thermody-
namics, Sect.
143.

Carpenter's
Principles of
Comparative Physi-
ology, p. 665.

"existed for several hours or even days, breathing, sucking, and performing various other movements. The same parts have been experimentally removed from birds and young mammalia, and all their vital operations have nevertheless been so regularly performed as to enable them to live for weeks or even months," provided, of course, that food is supplied to them. These singular facts well illustrate the statement which I have made, that consciousness is an element superadded to mere life, and not a development of it.

14. But it is when we arrive at the introduction into the world of conscious life, of a being endowed with conscience, that the evidence of a power external to nature is most irresistible. Whatever historical account Science may be able to give us of the origin of man, there must remain supreme over all such, the fact that in possessing the elements of a sense of duty man is distinguished from all lower types. This is his great pre-eminence. Reason may be shewn, perhaps, to be a matter of degree. It may be true "that the lowest forms of animal life are made possible only by a classification of impressions fundamentally the same as that which constitutes the most elaborate thinking of the civilized man." But the sense of duty, the possibility of a moral growth, the possession of an ethical character, differences man as he is from all other beings, and cannot be viewed as anything less than an addition to the elements which life before comprehended.

Spencer's
Psychology,
ch. VII.

It cannot be too often explained, that the moral nature of man is a capacity, not a power. It is not that man knows necessarily *what* is right, but that he understands what right means. The ethical history of the race shews a constant advance in the standard of duty, but

the feeling of the obligation, the possession of moral capacity, is a condition of the possibility of such a history, and the earliest times of which any account remains to us, present instances of as strong a sense of duty as any of which the latest can boast.

This character of nature's history, its exhibition of distinct steps, is forced upon us all the more strongly by the results of Science in the investigation of the *history* of these great innovations. The more we know of their origin, the more do we realize that their nature is inscrutable. Life, consciousness, conscience. What does Science, in its very latest advance, teach us of these? It appears to me to be simply this. Their history we may recover, of their inner nature we must remain for ever ignorant. Here then we may wisely fall back upon the hypothesis which we have been considering. The facts of Science can only be explained in their farthest analysis by that which transcends Science. Life, Reason (the higher development of consciousness), Conscience, must either remain as unaccountable phenomena, or they must be admitted to be the work of Infinite Goodness, of transcendent Reason, of a living God.

15. One other point may be briefly touched on before we conclude. We have already alluded to it. It is this, the agreement that there is between the subjective tendencies of the intellect and the characteristics of objective realities. The mind seeks for similarities, nature presents them. The intellect endeavours to classify, nature lends itself to the process. The species into which logic of necessity groups its conceptions, have their parallel in the kinds existing in fact. And this is not a necessary but an empiric connection. "For that
Kant, Crit. Pure Reason, p. 76.
 "objects of sensuous intuition must correspond to the

“formal conditions of sensibility existing *à priori* in the mind, is quite evident, from the fact that without these they could not be objects for us; but that they must also correspond to the conditions which *understanding* requires for the synthetical unity of thought, is an assertion the grounds for which are not so easily to be discovered. For phenomena might be so constituted as not to correspond to the conditions of the unity of thought; and all things might lie in such confusion, that, for example, nothing could be met with in the sphere of phenomena to suggest a law of synthesis, and so correspond to the conception of cause and effect; so that this conception would be quite void, null, and without significance. Phenomena would nevertheless continue to present objects to our intuition; for mere intuition does not in any respect stand in need of the functions of thought.” Under such circumstances as these reason would still possess its proper characteristics. The mind would still be determined toward unity, were all around it a chaos. Did events give birth every moment to heterogeneous and discordant combinations, were antecedent and consequent unconditionally variable, did experience present only the formless and the void, the mind would still be what it is, as concerns its aims and its capacities. Not only would sensation continue to present to it the images of the chaos without, but the understanding would, then as now, occupy itself in referring these intuitions to an object, and endeavouring to form, though out of similarities merely accidental, some sort of conceptions and of generalizations. But how different from this supposed state of wretched contradiction is the relation of thought to experience as it really exists. Here, all is at one. Man

and his conditions agree. Life is not in painful opposition to the inner nature, but in generous harmony with it. And this correspondence of the laws of matter with those of mind is not causal. It is not that the facts experienced have impressed their own character upon the percipient consciousness; it is not that we endeavour to bring knowledge into order, because it is invariably given to us in an orderly form. This is contrary to the facts. Science, that is, orderly knowledge, is not brought into being by observation *alone*, it is the slow result of the application to experience of the laws which regulate thought; which, though they do truly apply (in modified forms) to nature at large, are by no means obvious to the general observer. They come to be detected gradually, and their discovery as objective facts is due to their prior existence as subjective necessities.

In illustration of this we cannot but remark the extreme weakness, logically considered, of that principle of Induction upon which all Science is founded. Viewed merely as a principle of experience it is founded, in the last resort, upon Bacon's "*enumeratio simplex ubi non reperitur instantia contradictoria.*" Nothing better than this weak foundation can be found for it, if it is considered simply as the result of observation. Such a basis is wholly unequal to the superstructure which Science has built upon it. Its real origin is to be sought, not in experience, but in the nature of the human mind. It lies in that innate presumption of order and system in which Science takes its rise, the particular applications of which are learnt only by experience, but which exists first of all in the mind as a condition of the possibility of any scientific enquiry. That nature should thus be found to harmonise with this mental characteristic, is

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not a necessary but an empiric truth, and it is one which becomes the more striking the greater the advance which Science by means of Induction is able to achieve. Now that Science has proceeded so far upon this course, now that Chance, to which earlier speculators were forced to have recourse, is finally eliminated, now that the laws of nature are seen to be as rigorous as the laws of thought and to be directed by the same principles of simplification and comprehension toward the same end, unity,—must we not recognize in the harmony thus revealed between the subject and the object of knowledge a common origin, and an intelligent design?

16. In this very imperfect review of the bearing which Scientific discoveries have upon the question of the existence of an Intelligent First Cause, I have looked rather to the tendencies of the progress of knowledge than to its constituent items. It is evident that isolated facts, however important in themselves, are wholly inadequate to produce a change in any of the universal convictions of mankind. It is only from the effect of Science *as a whole* that such beliefs have anything to fear, and it has been the object of this Essay to show that, viewed *in the aggregate*, “the discoveries of Science do “not tend to impair the argument” in question. It may be doubted whether any results which could flow from the advance of Physical knowledge could produce any serious effect upon convictions, whose real basis lies deeper than the reasoning faculty itself. It is upon the *arguments* which are adduced in favour of the belief, and not upon the true grounds of the conviction itself, that experience, however extended and systematised, has any bearing. Such arguments have, of course, this inherent weakness, that their principle is a matter of assumption,

not of proof. All reasoning proceeds from grounds, which are considered, for the purpose of the particular case, as established; and in an argument so fundamental as this, there is obviously no deeper basis upon which we can found the principles which gives it its logical cogency. The ground of all argument is assumption. Faith underlies Reason, and is a condition of its possible exercise. But this necessary logical imperfection in the proof, is one with which Science is not concerned. Its own reasonings are built upon a foundation equally insecure; a parallel difficulty lies at the root of all speculation, whether physical or metaphysical. And it is because the argument under consideration is calculated by its very nature to produce not a demonstration, but a presumption, that we inquire whether external experience tends to confirm or to weaken the probable truth of the result. It is to this question that our investigation has been directed, and it only remains, now, to sum up the conclusions to which we have been led. They are briefly these.

17. In the first place, Science has not impaired the reasoning by which we deduce from the knowledge of our own being the existence of an Infinite mind; it has, on the contrary, increased the presumption of its truth, by weakening the force of the objections which, from the sceptical side, have been urged against it. In the second place, it has added increasing weight to the argument from design, when broadly viewed, and when regarded not as a demonstration of the *existence* of a First Cause, but as a confirmation of the belief in its intellectual character, to which the former argument leads us.

As regards the main argument, we have seen how both minor and major premiss have received confirmation

from the general progress of Science. Science has made us realize more than ever our own littleness, and yet has shewn us what our intelligence, rightly directed, may accomplish. It has started with the principle of causation, it has achieved its triumphs in virtue of its assumed validity, and is yet compelled to admit that experience cannot shew us anything stronger than uniform succession. It confirms the principle, but leaves it to Theology to give to it its final and satisfactory application. Moreover, its tendency to materialism may serve to shew the increased weight which it has given to the probable reality of the external world, the intellectual proof of which is a syllogism parallel (though of a weaker character) with that of Natural Theology.

Again, we have seen that Science advances constantly in the direction of Unity, and yet that it neither has reached, nor can hope ever to reach it. Its tendency thus confirms the reasoning, which it can never supplant. It has, besides, shewn to us, in some of its more recent developments, that the History of the Universe is not a cycle but an evolution. It has thus finally disproved the notion of its fixedness and eternity, and confirmed the belief of mankind in every age that the centre of nature is beyond nature.

In our survey of the argument from design, as affected by the discoveries of Science, we saw that while it had destroyed many supposed proofs of contrivance, it has given us, in place of them, deeper and more convincing evidence of Intelligence. In the august spectacle of order and symmetry which the Universe, as Science exhibits it, presents, we have seen a sure indication of the workings of Infinite Reason. In the Initial circumstances which are seen to be required to account for the develop-

ment of energy, we have an evidence of design which can scarcely be evaded: while the splendid conception of nature, as evolved from simple elements, and ever advancing towards Higher perfection, has been seen to be the most striking proof that can ever be given, of the Mind which animates and directs the whole.

Lastly, we have seen in the harmony which exists between the laws of mind and the laws of nature, as now exhibited to our view, a confirmation of our belief that both are the work of the same Almighty wisdom.

Science is now, more than ever, ready to acknowledge its own necessary limitations. "Ultimate Scientific Ideas," says Mr Spencer, "are all representative of realities, which cannot be comprehended. After, no matter how great a progress in the colligation of facts, and the establishment of generalizations ever wider and wider, after the merging of limited and derivative truths in truths that are larger and deeper, has been carried, no matter how far, the fundamental truth remains as much beyond reach as ever."

First Principles.

What conscience suggests as a Postulate of the Practical Reason, the intellect applies as an hypothesis to explain the riddle of existence; how far it is adequate to the solution, I have endeavoured in this Essay to shew. Experience, it is certain, cannot give us any demonstration of an Intelligent Cause, but Science requires the assumption in order that it may attain to that unity toward which its whole history is an advance.

Thus, in very different departments of human knowledge, Science and Theology are aiming at the same point. The unity which the one vaguely suggests, is clearly presented to us by the other. Where intellect

fails us, conscience and emotion have their own revelation, and the Θεὸς ἄγνωστος, though indeed "a God that hideth Himself," is known, adored, and loved by the being whom in His own image He has created.



